34th Year AUGUST, 1950

RUBBER AGE

Your Product Has a Future

PROTECT IT WITH AN

"AGE RITE" ANTIOXIDANT

R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.

Du Pont announces

ETHEX

(ZINC DIETHYL DITHIOCARBAMATE)

- **AS A PRIMARY ACCELERATOR IN LATEX:** Fast-curing Ethex can be used in all types of dipped goods, including toys, balloons, bladders and doll skins.

- **AS A SECONDARY ACCELERATOR IN LATEX:** Ethex is an excellent activator for Zenite and other thiazoles. Such combinations are fast-curing and impart good aging properties. Zenite-Ethex combinations are valuable in latex thread and latex foam compounds.

- **FOR SAMPLES** and further information see your Du Pont representative or write: E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Delaware.

DU PONT RUBBER CHEMICALS

E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

DU PONT

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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York 19, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year; Canada, $3.50; Foreign, $4.00. August, 1950, Vol. 67, No. 5.

now's the time to begin thinking about **SCORCH** problems

the answer is Good-rite VULTROL!

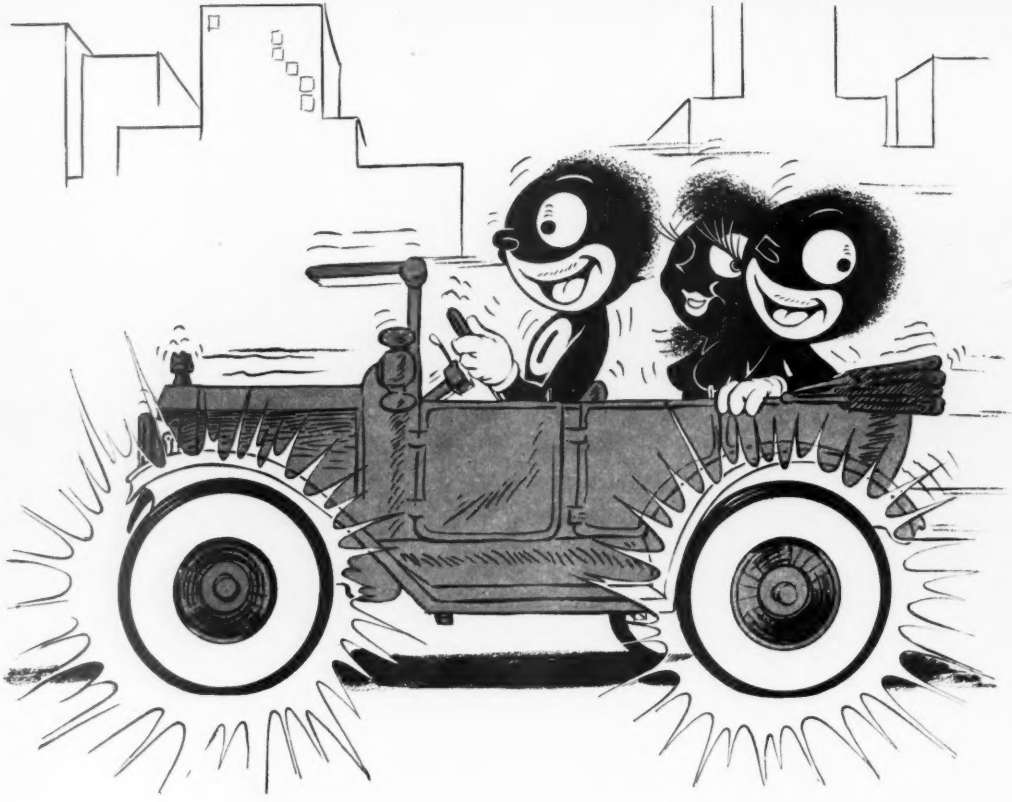
BE ready for hot weather *before* it hits! Be ready with Good-rite Vultrol to protect your tire tread processing against scorching. For this *proved* rubber chemical is *doubly* valuable during hot weather months when scorch problems are at their worst.

Good-rite Vultrol has *extra* advantages. It retards scorch without loss in quality at optimum cure. Many anti-scorch agents retard cure at all temperatures. But Vultrol retards cure at processing temperatures only, and actually activates slightly at curing temperatures. And Vultrol is especially valuable as a means of recovering partially-scorched stocks.

Vultrol is used successfully with natural rubber, GR-S and nitrile rubbers. Reinforcing furnace black tread stocks can be safely processed with it the year 'round. It is economical and easy to use. Send for complete information about the properties of this stock-saving, money-saving rubber chemical. Please address Dept. CA-4, B. F. Goodrich Chemical Company, Rose Bldg., Cleveland 15, Ohio.

B. F. Goodrich Chemical Company A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers



For white wall tires that stay that way

Use Philblack* O *or* Philblack* A!

There's no stain problem when you use either Philblack O or Philblack A in carcass stocks of white side-wall tires. These superior blacks do not bleed through the white rubber stock. They don't stain the dazzling white walls. And they do an excellent job of improving the good looks and life-expectancy of the tire!

Philblack A dissipates heat, too; helps tires run cool! And Philblack O, the high abrasion furnace black, provides amazing flex life and remarkable resistance to cuts, cracks, and abrasion. For your convenience, the Philblacks are available in bags or bulk.

PHILLIPS CHEMICAL COMPANY

PHILBLACK SALES DIVISION

EVANS BUILDING · AKRON 8, OHIO

Warehouses in Akron, Boston, Chicago and Trenton. West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.

*A Trademark

TESTS LIKE THIS prove **Pliolite S-6B** gives two points higher Shore Hardness than competitive resins in standard shoe sole stock.

Shoe sole makers:

You get higher hardness and easier processability

with PLIOLITE S-6 B

ALONG with easier processability, shoe sole makers are finding new advantages when they use **Pliolite S-6B** as their reinforcing resin. In test after test, soles made with this use-proved resin averaged two points higher hardness—quantity for quantity—than competitive resins.

In addition, full-scale production by independent shoe sole makers using this resin has shown superior dispersion characteristics, lighter color, and greater flex-life in soles.

Pliolite S-6B has low specific gravity, excellent reinforcement ability, outstanding electrical properties, improved flow and minimum shrinkage – making the resin well worth evaluation by makers of flooring, molded items, inflated goods, electrical insulation and a wide range of products in addition to shoe soles.

Write today for full information and samples to:

Goodyear, Chemical Division
Akron 16, Ohio

GOODYEAR

Pliolite—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

HIGH GRADE CALCIUM CARBONATE EXTENDERS AND FILLERS FROM SELECTED CRYSTALLINE MARBLE

GamaCo

Because of its low top particle size, GamaCo gives unusual performance as to extrusion rate, flex resistance, and abrasion resistance. In comparison with other similar pigments it will show moderate increases in modulus and tensile strength. These tendencies are due in part to its straight line distribution—and the absence of an excess of extreme fines. GamaCo disperses relatively quickly and thoroughly.

CALWHITE

Calwhite's particle size range makes it of interest in extruded goods and proofed goods where dry ground products (a small percentage of the particles which are usually over 40 microns) create processing and finishing problems. Compared with other similar pigments the slight reduction in its particle size permits increased loadings of 20-50% without loss of physical properties.

CHECK THESE ADVANTAGES OF GEORGIA MARBLE CALCIUM CARBONATE

1. Uniformity of color, particle size, moisture content, packaging—safeguarded by constant control.
2. Unlimited company owned and operated natural resources.
3. Three large New Mills (built post war) with the most modern equipment for producing water ground and air floated, classified calcium carbonate pigments.
4. A milling capacity large enough to fill all orders promptly—regardless of size.
5. A wide range of particle sizes from 200 mesh to minus 10 microns.
6. Mixed carloads at carload prices.

PRODUCED BY

CALCIUM PRODUCTS DIVISION

The Georgia Marble Co., Tate, Georgia

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Joseph C. Burns & Co., Pittsburgh, Pa.
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Marvinol® vinyl resins put more buy-appeal in these products

"Dry hand" and stitch-tear resistance makes Marvinol-based calendered sheets pleasant to touch, lasting, easy to work.

High physical properties and ease in processing, printing, embossing and heat-sealing are found in cast, calendered or extruded Marvinol-based films.

Resistance to cut-through, good electrical qualities and rapid extrusion rates are the extras Marvinol formulations offer extruders.

Sharply detailed Marvinol-based products are made by injection, low pressure, compression, slush and blow molding processes.

In new vinyl sponging operations, Marvinol formulations are being used for tough, lightweight cellular products.

Smart, colorful, long-wearing floor coverings are made from Marvinol-based formulations.

MARVINOL vinyl resins put buy-appeal in your products from the start. For superior physicals, Marvinol VR-10. For ease in processing, plus good physicals, Marvinol VR-20. Both resins offer you stability under heat, light and time; dimensional stability; low temperature flexibility; resistance to abrasion, wear, tear, oils and acids. Let us show you how to use Marvinol's timesaving features. All technical information developed in our modern laboratories is at your disposal, since it is through you that Marvinol reaches the consumer. Write today for the latest technical information. Dept. R-8, NAUGATUCK CHEMICAL, Naugatuck, Connecticut. *In Canada*, Naugatuck Chemical, Elmira, Ontario.

Other Products of Naugatuck Chemical:

KRALAC molding powders • VIBRIN Polyester resins • PQL chemical and heat resistant baking enamel • SHRINKMASTER process for rendering woolens shrink-resistant and long-wearing • SPERGON fungicide for seed treating • TUFOR 2-4-D weed killers • PHYGON orchard and row crop spray fungicide • SURFA-SEALZ rubber compound for surfacing highways • LOTOL compound latices, natural and synthetic • DISPERSITE water dispersions of reclaimed rubber and resins • Reclaimed Rubber • Aromatics • Synthetic Rubber • Rubber Chemicals • Raw Latex • Plasticizers

Marvinol

NAUGATUCK CHEMICAL

DIVISION OF UNITED STATES RUBBER COMPANY

CUMAR* RESIN RH GRADE

IN NATURAL AND SYNTHETIC ELASTOMERS

"CUMAR" Resin, RH Grade, is used to impart many desirable properties to fabricated and laminated items, camelbacks, tire-repair stocks, footwear, printers' rolls, rubber-to-rubber and rubber-to-metal parts, adhesives, cements, and solutions.

1 TO IMPROVE ADHESION

Used in conventional proportions, "CUMAR" Resin, RH grade, does not cause sulfur bloom to occur on raw compounded stocks. It confers tack to the stocks and prevents them from drying out over long storage periods, thus promoting better adhesion.

2 AS A PROCESSING AID

"CUMAR" Resin, RH grade, lowers viscosity, modifies the nerve, and reduces shrinkage; thus contributing to smoother and faster processing, calendering, and extruding properties.

3 FOR EXTENDING THE ELASTOMER

"CUMAR" Resin, RH grade, is unusually effective as an extender. It permits increased loadings with no sacrifice in quality, thus allowing reduced compounding costs.

4 FOR CEMENTS

"CUMAR" Resin, RH grade, accelerates breakdown time of rubber, and improves tack.

5 IN RUBBER-METAL ADHESION APPLICATIONS

"CUMAR" Resin, RH grade, promotes stronger adhesion between rubber and metal. Applied in 2% to 5% solutions in benzol or similar aromatics, the resin forms a tough film on brass-plated or sand-blasted metal surfaces, preventing the formation of rust or scale prior to the application of bonding cement or tie-gum stock.

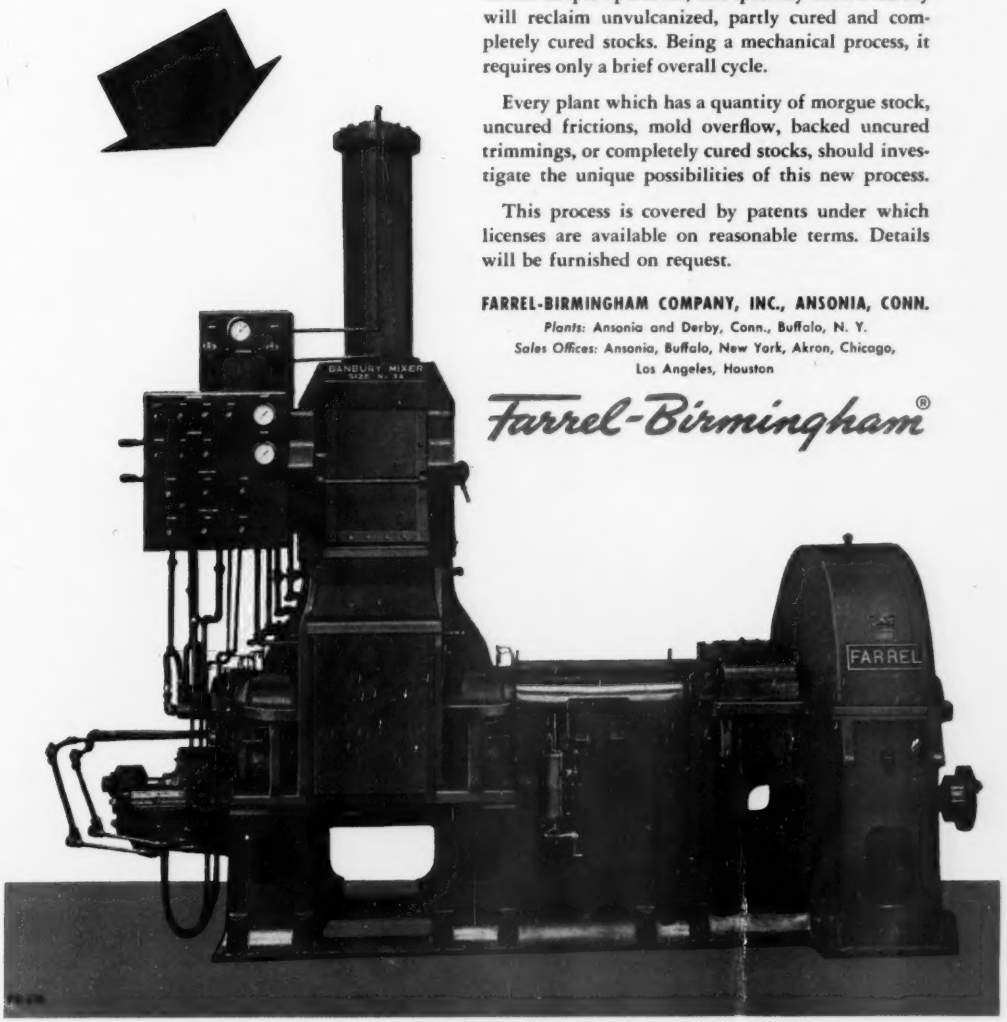
Barrett*

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N.Y.
In Canada: The Barrett Company, Ltd.
5551 St. Hubert St., Montreal, Que.

*Reg. U. S. Pat. Off.

NEW BANBURY RUBBER RECLAIMER AND DEVULCANIZER

PRODUCES HIGH QUALITY RECLAIM AT EXTREMELY LOW COST



In one simple operation, this specially built Banbury will reclaim unvulcanized, partly cured and completely cured stocks. Being a mechanical process, it requires only a brief overall cycle.

Every plant which has a quantity of morgue stock, uncured frictions, mold overflow, backed uncured trimmings, or completely cured stocks, should investigate the unique possibilities of this new process.

This process is covered by patents under which licenses are available on reasonable terms. Details will be furnished on request.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

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A CHANGE IN THE SALES POLICY FOR
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RUBBER-TO-METAL ADHESIVES
Effective September 8 Will Be
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CARBON BLACKS

UNITED CARBON COMPANY, INC.

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DIXIE 50

Battery of furnaces for the production of carbon black.

Dixie 50 is a United quality black with top rating for fast extrusion and glossy smoothness. It is unsurpassed as an aid in processing.

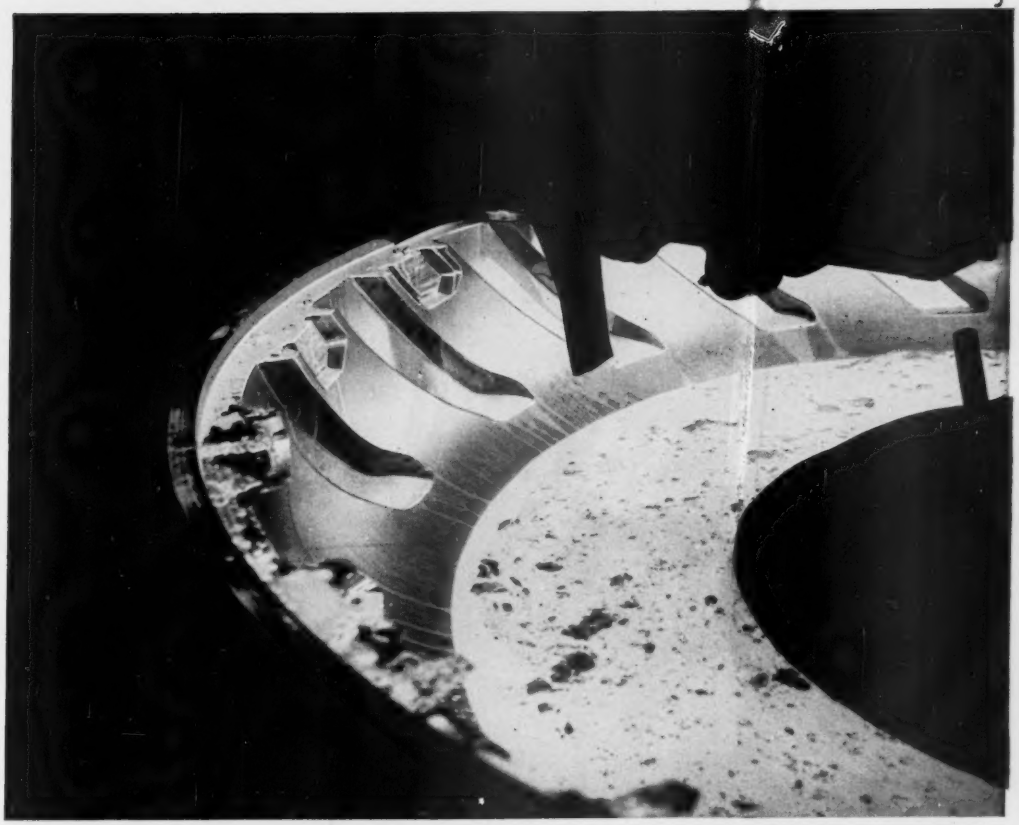
Dixie 50 is a furnace process oil-base black of the FEF (fast extruding) type. It is quick curing, strongly reinforcing, and resistant to abrasion.

Dixie 50 has wide applications and compounders take to it for obvious reasons. Standardize on Dixie 50 for improved efficiency and leadership.

RESEARCH DIVISION

UNITED CARBON COMPANY, INC.

Charleston 27, West Virginia



ENGRAVED MOLDS WITHOUT SIZE LIMIT

are now practical . . . at low cost

IF IT were not for the heavy duty engraving machines designed and built by BRIDGWATER, engraved steel or iron molds for giant "off-the-road" tires would be prohibitively costly . . . if not impossible to make.

With these precision engraving machines we can engrave molds of cross sectional widths up to 27", with outside diameters over 100", and more important, with an outside tread radius of up to 30" . . . and at a cost, often less, and certainly no greater, than cast aluminum molds.

This development by BRIDGWATER of a means to extend the recognized advantages of engraved steel or iron molds to the manufacture of giant size tires is just another example of our determination to make molds of whatever characteristics the tire industry requires . . . at the lowest possible cost.

ATHENS MACHINE DIVISION

THE BRIDGWATER MACHINE COMPANY

Akron, Ohio

FOR BETTER MOLDS FOR BETTER TIRES *SPECIFY* BRIDGWATER

Indispensable TO YOU IN THE RUBBER INDUSTRY—

Gives Your Products

PROTECTION and SALES APPEAL

at Little Cost!

BEACOFINISH—a unique family of coating materials conceived to give your products greater durability and eye appeal. These highly concentrated wax emulsions that can be diluted with up to four parts of water can be used with the utmost safety and economy.

BEACOFINISH is therefore of four-fold importance to you:—

1. ***It Protects*** your products against their natural enemies—air, sunlight, moisture and excessive handling.
2. ***It Improves*** the appearance of your product for its uniform coating stimulates greater consumer interest.
3. ***It's Economical*** because its high dilution potential (without losing efficiency) allows one gallon to cover 15,000 sq. ft.
4. ***It's Safe*** being a wax in water emulsion, it eliminates the fire and health hazards of volatile-solvent based finishes.

BEACOFINISH can be applied by dipping, sponging, spraying or brushing—dries in about 20 minutes—faster if force-dried—to give a hard protective coating of great elasticity.

BEACOFINISH may be ordered in Neutral or Black, in varying degrees of luster from brilliant to dull. It is so concentrated, from one drum you can obtain potentially up to five drums of superior coating for your products.

CONSULT US—WRITE US TODAY

Let us show you how BEACOFINISH can make your products more attractive and saleable—protect them from damage—you from loss—in production and transit!

THE
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PURITY-UNIFORMITY-DEPENDABILITY
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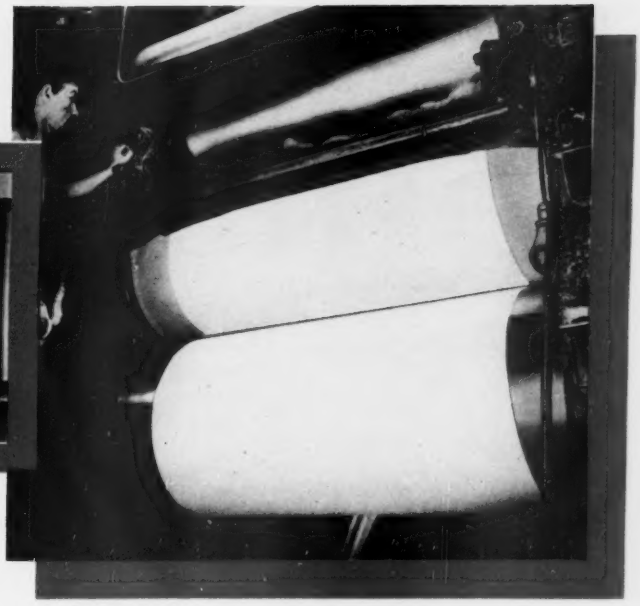
UNIFORMITY

Makes the Big Difference

In INDUSTRIAL Fabrics

The greater uniformity of Mt. Vernon fabrics means *consistent* quality in your finished products – smoother, more efficient fabrication.



DETERMINING YARN NUMBER WITH SUTER SCALES After Breaking Skein. One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

Mt. Vernon-Woodberry Mills

AT YOUR SERVICE – Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

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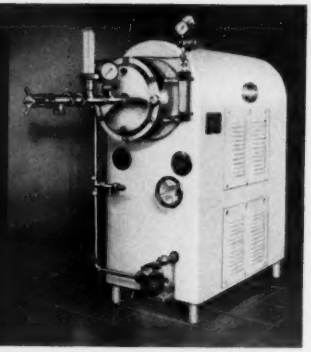
OAKES
CONTINUOUS, AUTOMATIC
FROTHING MACHINE



GIVES YOU IMPORTANT

UNIFORM CELL STRUCTURE ON LATEX WORK

200 to 2,000 pounds of liquid latex per hour.

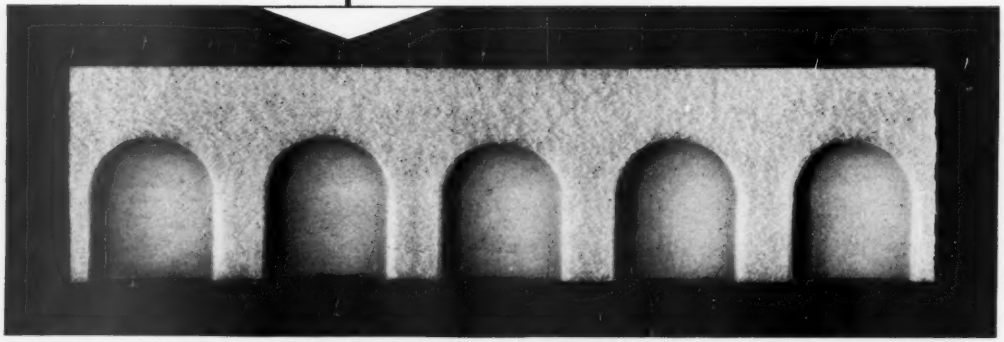
Produces latex blow-ups of 6 to 18

Ideal for slab or mold work, rug backings, pillows, mattresses, furniture and automobile upholstery.

Suitable for INJECTION MOLDING

FOR COMPLETE INFORMATION

Write to Mr. T. R. Stevens,
Continuous Mixing Division,
AMERICAN MACHINE & FOUNDRY COMPANY
485 Fifth Avenue, New York 17, N. Y.



Unretouched photograph of foam rubber frothed on the AMF-OAKES Continuous, Automatic Frothing Machine. (Latex blow-up of 14)

Piccolyte PAGEANT

Pick Any One..

and you get them all

Even if you select only *pale color* as the Piccolyte virtue you want, you will find that the other inherent advantages of this versatile synethic resin provide many practical benefits. Stability, low-cost, compatibility with other materials, chemical inertness, petroleum-solubility are but a few of the features that you can use to improve your products and reduce your costs.

Piccolyte is economical, and easy to use. It is available in nine grades, from soft to hard, horny. Write for a generous test sample, and describe your application so that we can send a suitable grade.

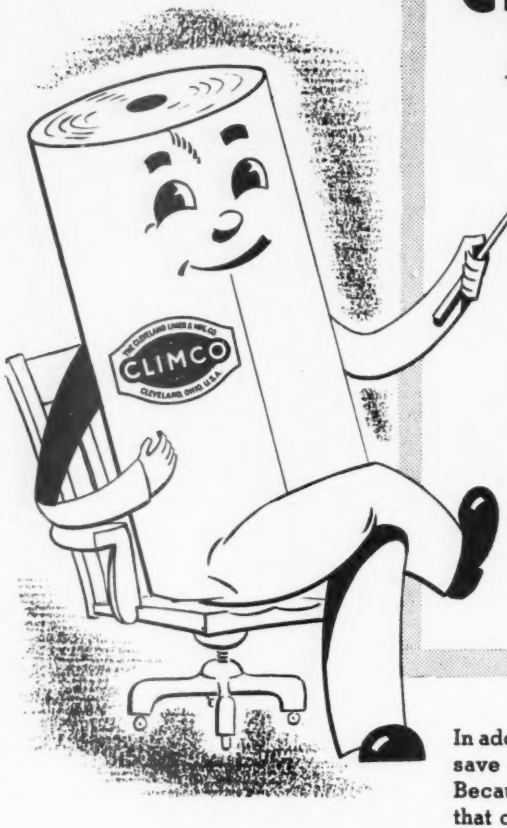
PENNSYLVANIA INDUSTRIAL CHEMICAL CORP.

Clairton, Pennsylvania

Plants at Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

Distributed by Harwick Standard Chemical Co., Akron 5, Ohio

MR. CLIMCO SAYS...



CLIMCO LINERS

benefit stocks in all these ways -

- Lint and ravelings are eliminated
- Air, moisture and sunlight are excluded
- Oxidation, mould and bloom are prevented
- Freshness and tackiness of stock are preserved
- Stock gauges are more easily maintained
- Latitude in compounding is enlarged

In addition to these important features, Climco Liners save time and money in production operations... Because they separate perfectly, stock adhesions that cause costly down time are eliminated.

Since 1922, leading rubber companies have found that Climco Processing repays its moderate cost many times over. Give them a trial in your plant.

ILLUSTRATED LINER BOOKLET

Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

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LINERETTE INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO
PROCESSED LINERS

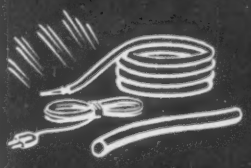
Serving the Rubber Industry for 26 Years

CLIMCO — CLIMCO

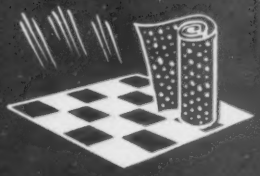
meet the "POLLY" TWINS

✪ Polycizer 332 AND 162

Two new plasticizers make their debut . . . POLYCIZER 332 and POLYCIZER 162 — a pair that can contribute vital improvement to your vinyl and other synthetic resin and rubber products — and reduce production costs, too —



In Vinyl Extrusions
For improved heat resistance, higher loading without exceeding hardness requirements, better low-temperature properties, good light stability . . . it's POLYCIZER 332, or for better general plasticizing . . . it's POLYCIZER 162.



In Heavy-Loaded Stocks
For good heat and light stability . . . it's POLYCIZER 162. For lower plasticizer content or higher filler load without impairment of quality . . . it's POLYCIZER 332.

In Film Sheeting, Plastisols, Organosols
For low volatility, better heat and light stability, less odor . . . it's POLYCIZER 162. For better low temperature properties, better hand and drape . . . it's POLYCIZER 332.

In Oil-Resistant Rubbers
For better plasticizing, softer stocks, extreme low-temperature flexibility and low volatility . . . it's POLYCIZER 332. For better plasticizing with low volatility . . . it's POLYCIZER 162.

POLYCIZER 332 (Dioctyl Adipate) is free from odor, is low in acidity, and practically colorless. It is recommended for use either as an entire or partial plasticizer in calendering, molding, extruding, organosol and plastisol processes . . . POLYCIZER 162 (Dioctyl Phthalate) is also odorless, low in acid and practically colorless. It is recommended as an all-purpose plasticizer for use with all types of resins.

Write for complete data.

✪ "POLYCIZER is a name registered as a Trade Mark by the Harwick Standard Chemical Co.

HARWICK STANDARD CHEMICAL CO.

AKRON, OHIO

BRANCHES: BOSTON, TRENTON, CHICAGO, LOS ANGELES

How Skellysolve helps 3 men Reach 1 Goal . . .

THE CHEMIST

finds that Skellysolve will enable the plant to make rubber cements with the properties he desires. So he informs

THE PURCHASING AGENT,

who orders a tank car of Skellysolve. The result is a superior compound which makes

THE SALES MANAGER'S

job easier. His tape customers are better satisfied, and the special qualities of his compound help him get new business from other users of rubber cements.

Selling More and Better RUBBER CEMENTS

"DOC" MacGEE SAYS: You'll find this happening in several other branches of the rubber industry. Thus, if you use benzol, rubber solvent gasoline, toluol, ether, carbon tetrachloride or other solvents either in fabricating operations or in making rubber cements, find out what Skellysolve can do for you. Learn, too, about Skellysolve's famed dependability of supply . . . and the technical help you may receive from a Skellysolve Technical Fieldman.

the Rubber Industry and Skellysolve

There are six different Skellysolves for making rubber cements and for use in other rubber fabricating operations. Skellysolve has a minimum of greasy residues, thereby giving quick drying and high tensile strength. It is less toxic than many solvents, thus reducing health hazards. It has a minimum of unsaturates and impurities, thereby reducing the tendency to thin or gel. Its low vapor pressure eliminates bloated tubes or cans, and its sweet odor makes it pleasant to work with.

SKELLY

Skellysolve

SOLVENTS DIVISION, SKELLY OIL COMPANY, KANSAS CITY, MO.

Have you refigured your delivered pound volume costs since freight rates were increased

CALCENE T RESULTS IN SAVINGS WHEN COMPARED WITH MANY OTHER PIGMENTS

Write for Columbia Pigments Data Sheet No. 49-1. It provides you with information of value in comparing the delivered pound volume costs and performance of Calcene T with various reinforcing pigments. Calcene T also has the advantage of easy dispersibility due to its surface coating and particle size.

With the new emphasis on lowering production costs, the use of Calcene T affords an excellent means of effecting economies. Data and test samples may be obtained on request to Pittsburgh Plate Glass Company, Columbia Chemical Division, Fifth Avenue at Bellefield, Pittsburgh 13, Pa.

COLUMBIA CHEMICALS

CHICAGO • MINNEAPOLIS • BOSTON
NEW YORK • CINCINNATI

ST. LOUIS • CHARLOTTE • PITTSBURGH
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PAINT • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

CUSTOMERS BUY BY APPEARANCE TOO!

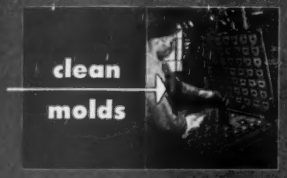
Your salesmen know that appearance is often the deciding factor in successful selling. And your production men know that not only do Dow Corning silicone release agents improve the appearance of molded rubber products, they often are also the deciding factor in successful production.

The loss of one auto floor mat molding, for example, means several pounds of scrap, lost time, and wasted man-hours. Progressive manufacturers cut scrap as much as 80% with DC Mold Release agents — and produce a better-looking, easier sold product at the same time!

DC Mold Release Emulsions for molds and curing bags, or DC Mold Release Fluid for bead and parting line — both assure clean, easy release from clean molds, uniformly fine detail, closer tolerance and sales-stimulating appearance.

SO SPECIFY

DOW CORNING SILICONE MOLD RELEASE AGENTS



Dow Corning Silicones Mean Business!

For more information write today for data sheet R-18

DOW CORNING CORPORATION, MIDLAND, MICHIGAN

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In Canada: Fiberglas Canada Ltd., Toronto

Great Britain: Albright and Wilson Ltd., London

Dow Corning

FIRST IN SILICONES

FAWICK CLUTCH & BRAKE UNITS WILL PRODUCE MORE ON YOUR MILL AND WITH GREATER SAFETY

Full drive power; quick shock-free starts and stops; split-second operating control; long, maintenance-free life—that's what you get when your rubber mill is equipped with a Fawick Clutch and Brake!

The instant shock-free response and full-power operation provided by these Fawick units on a mill drive increase worker safety and mill production efficiency.

The precision-built, rugged Fawick Clutch and Brake bring new flexibility and FULL power to your mill drive through (1) 360° constant-velocity contact with the friction surface and (2) the shock-absorbing flexibility of the torque-transmitting rubber tube.

A Fawick Clutch and Brake on your mill means no "downtime" for clutch or brake adjustment or lubrication. Even after long periods of satisfactory service, only the friction shoes need be replaced. And this is done without the expense of moving the driving or driven parts of your mill.

For specific information on all advantages of Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland, Ohio, for Bulletin 300.

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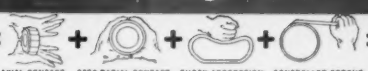
FAWICK CLUTCHES =  = PEAK EFFICIENCY

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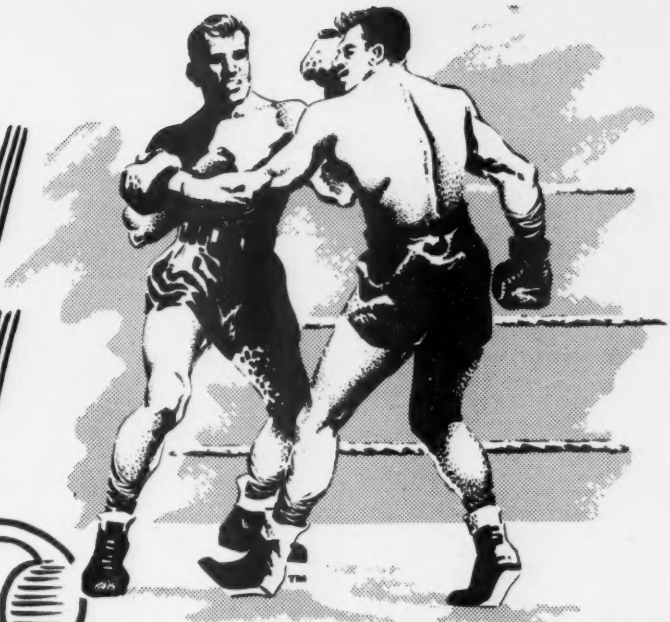

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TRADE MARK

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Du Pont "**Alamask**" odorants
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FOR FASTER PROCESSING ● FOR HIGHER REINFORCEMENT

Both Protox-166 and Protox-167* bring you all the well-known advantages of American Process Zinc Oxides . . . *plus* these important features:

- Faster, more uniform mixing
- Quicker, smoother tubing and calendering
- Improved tensile and tear resistance
- Higher modulus and resilience

Which Protox should you use? Consider these points:

1. Protox-166 and Protox-167 are essentially identical in processing and reinforcement properties, as indicated in the table below.

2. In Protox-167, dusting is practically eliminated and dispersions are even somewhat improved in comparison with Protox-166.

3. Protox-166 should be continued in use where water suspensions of Zinc Oxide are involved, as Protox-167 is resistant to wetting by water.

WHICH PROTOX DO YOU WANT TO TEST *NOW*?

COMPARISON OF PROTOX-166 AND PROTOX-167 ZINC OXIDES . . .

Identification	*Time of Cure (Min. at 20 lb.)*	*Tensile Strength (Lb./Sq. In.)*	*Per Cent Elongation*	*Load (Lb./Sq. In.) for Elongation of* 300%	500%	*Abrasion Resistance (Feldspar)*	*Shore Hardness*	*Tear Resistance*	*Min. to T-50 at 0°C*
[redacted]	10	675	700	120	315		31	25	39
	15	2200	670	440	1160		38	66	
	30	3420	655	660	1980	84	44	231	
	45	3560	635	785	2235	105	48	286	
	60	3600	620	825	2320	113	50	234	
	75	3515	605	850	2380		51	269	
	90	3380	585	855	2400		51	227	
[redacted]	10	1520	690	240	760		34	35	37
	15	2700	680	475	1390		39	87	
	30	3335	635	705	2000	82	45	237	
	45	3460	625	745	2120	101	48	325	
	60	3500	605	810	2300	106	49	306	
	75	3480	600	840	2320		50	308	
	90	3420	600	885	2340		51	270	

		Goodyear-Healey Pendulum			*Compression Fatigue (Goodrich Flexometer)**				*Cut-Growth Resistance Tested at 70°C. Inches Failure 90,000 Cyc.*
Identification	*Time of Cure (Min. at 20 Lb.)*	*Indentation in mm.*	*Per Cent Rebound*	*Hardness (of Block) Shore Rex*	*Per Cent Initial Comp.*	*Running Time and Per Cent Permanent Set*	*Max. Temp. Rise (°C.)*	*Dynamic Compression Initial*	*Final*	
[redacted]-166	60	9.31	83.4	47 50	20.4	15'-2.9	8.7	[illegible]	7.1	.65
[redacted]-167	60	9.25	84.1	48 51	21.1	15'-2.7	8.6	[illegible]	7.1	.73

FORMULA

Smoked Sheet	100
Sulfur	3
MBT	1
Agerite Powder	1
Stearic Acid	3
Zinc Oxide	100

***TEST CONDITIONS:** Load—93 psi; Stroke—0.25 inch; Oven Temp.—100°C.

	Williams 3' Plast.	*Plasticity Recovery*
[redacted]-166	2.35	.15
[redacted]-167	2.40	.17

*U.S. Patent 2,303,330

HORSE HEAD PRODUCTS

THE NEW JERSEY ZINC COMPANY

Founded 1848

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What customers say about

GENERAL ELECTRIC'S NEW SILICONE RELEASE AGENT

"Cuts my rejects from 25% to 10%."
"Most stable emulsion I've seen."
"Leaves no drag marks...gives better release."
"Doesn't discolor white sidewalls."
"Wets the mold better...more stable."
"More even release...prevents pocketing."
"No creaming after 20 days at 70 C... best emulsion we've seen."

G-E 81161

These are typical comments from G-E customers in the rubber industry who have tried the remarkable new G-E silicone mold release emulsion, G-E 81161

HERE ARE THE FIVE BIG ADVANTAGES OFFERED BY THE NEW G-E 81161:

1. Superior mold coverage—better performance on intricate molds.
2. Exceptional stability at room temperatures and above —it remains stable up to 150 F.
3. Hard water stability; if remains stable 24 hours at ½% dilution in water of 750 PPM hardness.
4. Stability under mechanical working; won't break or cream under *repeated* recycling in centrifugal pumping systems.
5. Will not stain light-colored stocks.

If you haven't yet tried G-E 81161, test it in your own plant and see how it helps you mold better products, cuts reject losses and avoids mold down time. For details, write to Section J2, Chemical Department, General Electric Company, Pittsfield, Mass. (Canada: Canadian General Electric, Toronto)

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A LIQUID ACCELERATOR FOR LATEX— NATURAL and SYNTHETIC

✓ SIMPLIFIES LATEX COMPOUNDING ✓ ADD DIRECTLY TO LATEX
✓ NO GRINDING OR BALL MILLING NECESSARY

Merac Offers these Advantages:

1. It is a liquid accelerator which upon dilution with water is added directly to latex.
2. It is faster curing at room and elevated curing temperatures than most accelerators.
3. It imparts high modulus and tensile strength with flat curing and good aging characteristics.
4. Its use provides compounded latex formulations which are stable on storage, exhibiting only moderate changes in viscosity.

PROPERTIES

Color—	Deep red to brown liquid
Odor—	Characteristic
Sp. Gr.—	1.034 at 20°C.
Solubility—	Miscible with water Soluble in alcohol

For technical information write to Dept. Q.

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the brightest name in pigments

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And that's only one of the three big advantages of Wyandotte's rubber extender — ***Purecal* U.*** At the same moduli, tensile strength, elongation and hardness, Wyandotte's Purecal U will *double* tear resistance.

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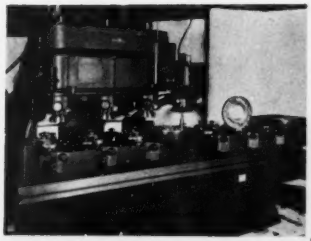
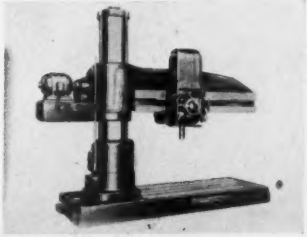
These five machines are representative of the complete line of machine tools of wide range and capacity, specially designed for making Quality Mechanical Molds, housed in this new plant.



HYDROTEL Milling Machine—3 spindle, 17¾" centers, 28" x 60"



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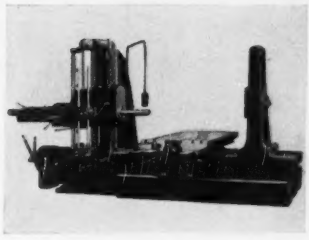
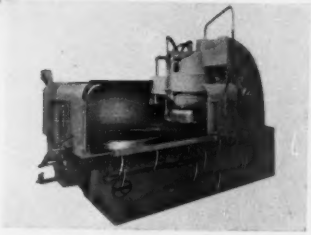


GRAY Planer, Open Side—48" x 16 Foot Table



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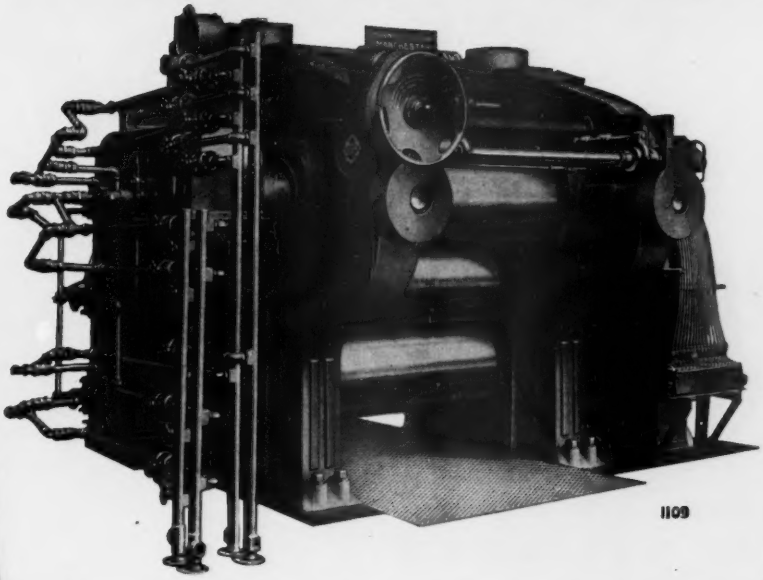

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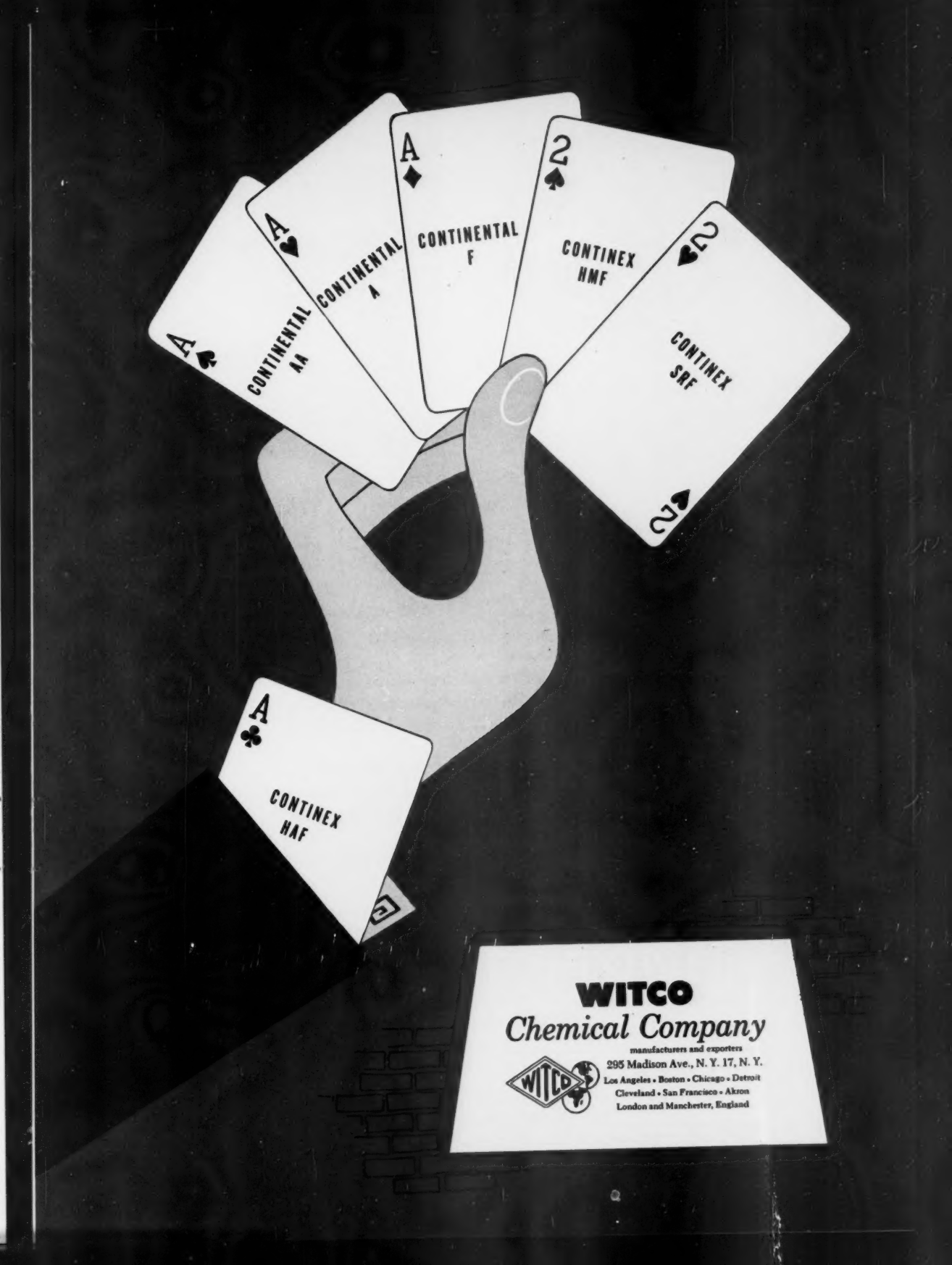
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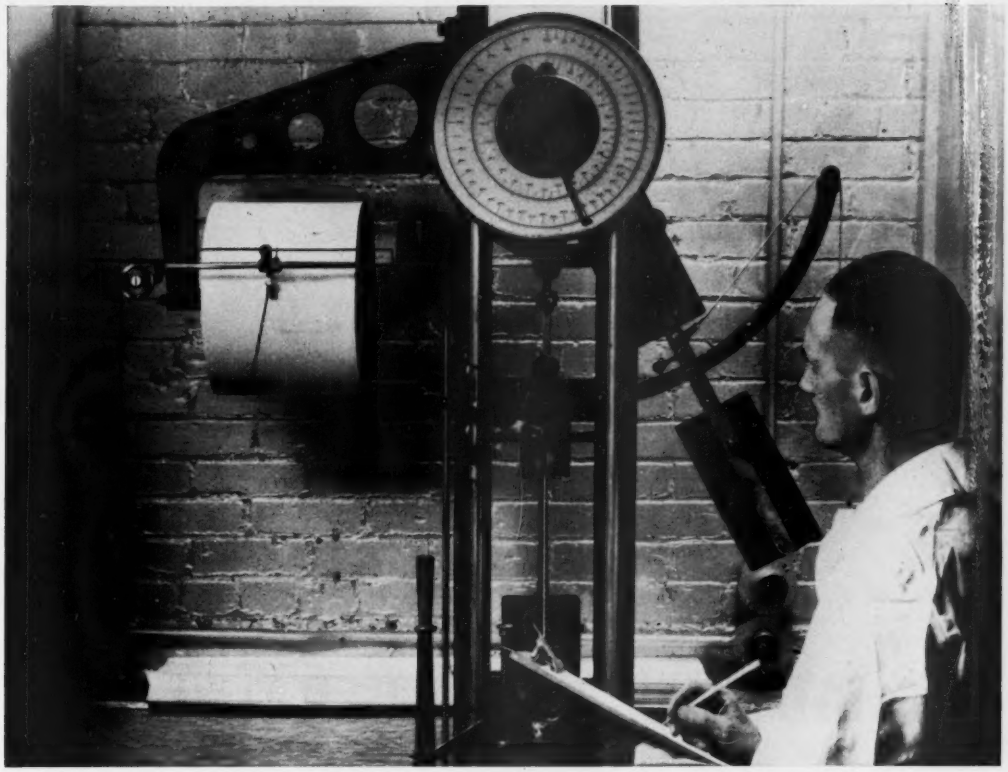

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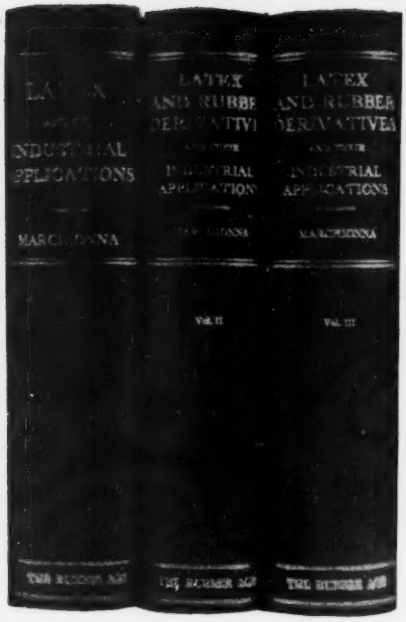

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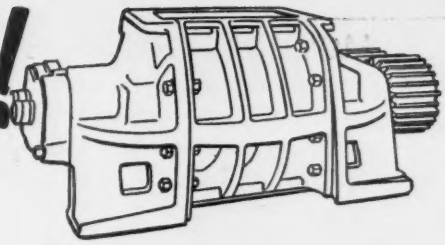

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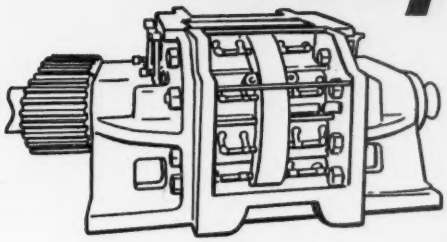

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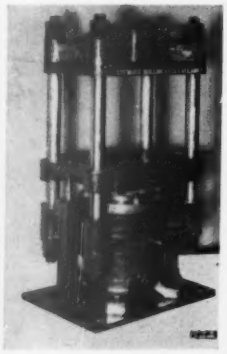

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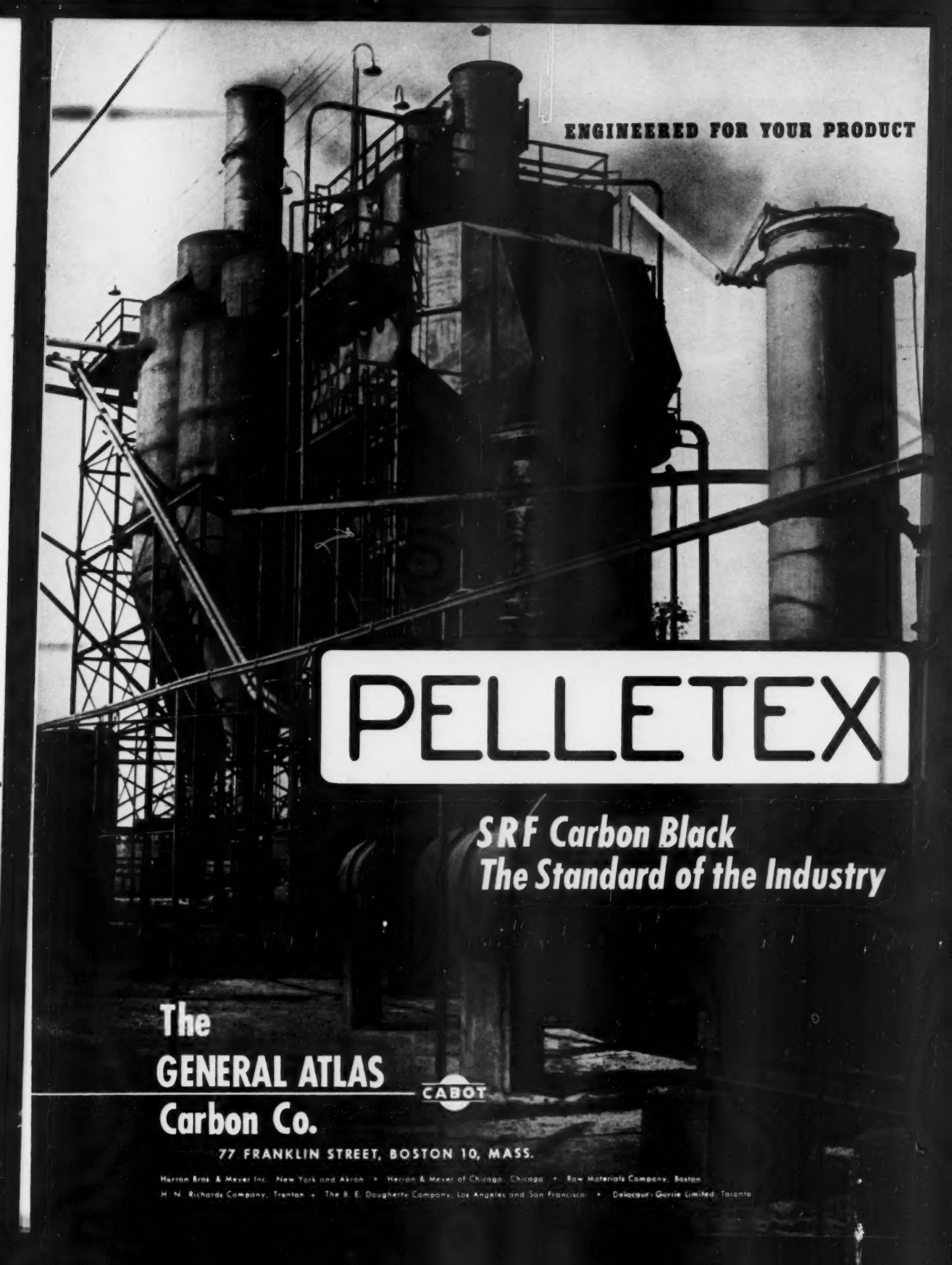
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Stearic Acid	1.5	1.5
Process Oil	7.5	7.5
Benzothiazyl Sulfenamide	1.	—
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Aktone	—	.625
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Tensile (psi)	3740	3720
Elongation (%)	470	425
Rebound (%-Goodyear-Healy)	62.7	63.5
Abrasion (cc loss/hr-Goodyear-Huber)	10.1	9.7
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Scorch Data (Mooney @ 250°F)		
½ Minute	64	67
15 "	53	52
30 "	52	54

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Vol. 67, No. 5 AUGUST, 1950

Plastisols and Organosols

A Review of Their Composition, Characteristics and Applications

By E. G. PARTRIDGE and G. O. JORDAN

American Anode, Inc., Akron 8, Ohio

THE use of vinyl polymers and copolymers in solvent solution, particularly in the manufacture of coated fabrics, is an old and important industry. The commercial use of vinyls in the form of plastisols and organosols is a relatively recent development *(1-5)*.

In work in the 1920's it was found that by mixing polyvinyl plastics in powder form with plasticizers on rubber mills, pastes could be obtained which, when heated in molds to cause fusion, yielded tough rubber-like products. A patent issued in 1933 to Dr. Waldo Semon *(6)* on this method was the basis of Koroseal. In using this procedure, the softening action of the plasticizer was increased by the milling and by the heat generated. When taken off the mill, these compositions were quite rubbery depending on the amount of plasticizer used. If the amount of plasticizer was increased, systems were obtained which were liquid when hot, but gelled when cooled to give very soft rubbery masses. Such compositions were not very extensively used, but were used commercially in the form of Korogels for preparation of rubber-like molds for casting of plaster articles. Because of the excessive amount of plasticizer necessary, such gels were very poor in physical properties.

In 1940 a patent was issued to Dr. Semon *(7)* describing a liquid system comprising finely ground insoluble polyvinyl halide dispersed in plasticizer which could be spread or shaped into articles without the use of heat which had been necessary with Korogels. This patent also mentions the addition of volatile organic diluents or water to lower the viscosity of such systems. The compositions, after being spread or formed into the desired shape, were heated to dissolve the particles and were cooled to gel or solidify them.

Since these beginnings, tremendous progress has been made in the field, resulting in the commercial materials called resin pastes. As there has been considerable confusion in the use of terms, let us define some of them: The term "resin paste" is a general term used to denote a "dispersion" of plastic resin particles in a liquid medium as contrasted with solutions in solvents such as have been commonly used for coatings. "Organosols" are resin pastes or dispersions which are colloidal sols of plastic particles in organic liquids; usually the organic liquids used include plasticizer and thinner, the thinner being a relatively volatile material. "Plastisols" are systems similar to organosols, but having only non-volatile plasticizers as dispersion media and no volatile thinners or diluents. "Modified plastisols" are plastisols to which small amounts of volatile diluents are added. The latter are not strictly plastisols since they contain volatile ingredients. On the other hand they differ in method of preparation and properties from organosols in that they are prepared from plastisols rather than by grinding paste resins in media containing volatile organic liquids and their properties are those of plastisols with lowered viscosity rather than of ordinary organosols, whose properties approach more nearly those of true solution systems.

Progress in commercial applications of organosols and plastisols was faster in Germany and England dur-

TABLE I—PASTE RESINS

Brand	*Supplier*
Geon 121 and 100 X 26 S	B. F. Goodrich Chemical Co.
Pliovic A	Goodyear Tire & Rubber Co.
Vinylite VYNV 1, 2 and 3	Bakelite Div., Union Carbide
Ultron	Monsanto Chemical Co.
Marvinol VR-10	Naugatuck Chemical

ing the war than in the United States, due to the greater pressure to find substitutes for rubber in the face of the lack of suitable synthetic rubbers. Judging from recent reports, it appears that at present a greater proportion of their production uses organosols or plastisols than in the United States, but that in technical progress in this field we are considerably ahead of these countries probably mainly due to the availability to us of a variety of chemicals such as plasticizers and stabilizers. We have also made great progress in the development of polymers and copolymers suitable for formulation of organosols and plastisols and in processes for making useful articles from them. An idea of the present commercial importance of these developments is given by the estimated 2,000,000 to 3,000,000 lbs. per month of plastics used in the U. S. in the form of paste resins divided roughly as follows: 15% in plastisols, 35% in modified plastisols, 50% in organosols. The trend is toward the use of more plastisols.

Theory of the Systems

Let us consider briefly the theoretical background of these systems. In solutions of vinyl polymers or copolymers, the plastic is in true solution or at least colloidal solution. Such polymers must necessarily be of such structure, chemical composition and molecular weight that they are soluble in the solvents to be used. This fact limits the choice of polymers and generally makes necessary a compromise between solubility of the polymer and desirable physical and chemical properties. The relatively low possible concentration of such solutions further limits their practical utility.

These disadvantages can be overcome by using polymers or copolymers which are not soluble in ordinary solvents at room temperature but have desirable physical properties and chemical resistance. Such polymers in the form of fine particles can be dispersed in plasticizers or organic liquids which will dissolve or fuse them only at high temperature. It was originally thought necessary that the polymer particles be very small and uniform in size—of the order of 1 micron in diameter—to give the desired low viscosity liquid systems and yet become sufficiently plasticized or dissolved to give homogeneous strong films on heating. It was thought that large particles would not properly fuse or dissolve at the higher temperature while extremely small particles would be gelled at room temperature causing high viscosity and hence difficulty in processing. More recent work has shown that it is desirable to have a certain range of particle sizes which gives optimum rheological or flow properties.

Further, it has been found that there is a difference in properties of such dispersions depending on the method used in arriving at the final particle size. Systems in which very fine powders are mixed into plasticizers or plasticizers plus organic diluents have properties resembling those of colloidal sols or suspensions while properties of systems formed by grinding larger particles or agglomerates to smaller size in the presence of the liquid dispersing media tend more toward those of solutions, having higher viscosities for a given concentration than the corresponding suspension. This is to be expected, as grinding the particles in the presence of the dispersing medium should give more solution or solvation than merely stirring the particles in. In addition, the physical structure of the particles is an important factor in determining properties by determining the ease with which plasticizer or solvent penetrates. Further, the properties also depend on the choice of plasticizers and diluents, which will be discussed later.

Chemical Composition of the Paste Resins

Commercial plastisols and organosols are made from polyvinyl chloride or vinyl copolymers. Copolymers may be those of vinyl chloride with vinylidene chloride or with vinyl acetate. The vinyl chloride constitutes the main part of these copolymers while the other monomer is present to the extent of only a few percent.

Compounding the Compositions *(1, 3, 4, 8)*

Resins: In compounding a plastisol or organosol, it is necessary first to choose from those available the resin or combination of resins best suited for the purpose In Table I are given the main commercial paste resins. Some of these resins, such as Geon 100 X 26 S and VYNV 1, are especially suited for use in organosols. Geon 121 and VYNV 2 are used for plastisols, the former being generally preferred because grinding is not necessary in preparing plastisols from it. Both Geon 121 and VYNV 2 are also used for organosols. It is often desirable to use mixtures of paste resins having different particle sizes, molecular weights or solubilities.

Plasticizers (9-28): The next step is the selection of a plasticizer or mixture of plasticizers. Great progress has been made in this field, both in the development of new plasticizers and in blending of plasticizers to obtain the desired properties. Many factors must be considered in making this choice. Some of these are listed in Table II.

Usually several plasticizers differing in these properties are blended to obtain the best results. Generally a primary plasticizer which has high dispersing and plasticizing value is combined with a secondary one which may lower viscosity, lower cost, or otherwise modify the primary plasticizer. Examples of primary plasticizers are given in Table III, while examples of secondary plasticizers are given in Table IV.

In cases where extremely low volatility or resistance to extraction by solvents is desired, polymerized plasti-

TABLE II—PROPERTIES OF PLASTICIZERS

Plasticizing action
Volatility
Tendency to migrate or bleed
Viscosity imparted to paste
Resistance to extraction
Heat and light stability
Abrasion resistance of films
Color
Odor
Toxicity
Low temperature flexibility of films
Flame resistance
Electrical properties
Cost

TABLE III—PRIMARY PLASTICIZERS

Chemical Composition	*Trade Name*	*Supplier*
Adipates		
Butyl Cellosolve Adipate	Adipol BCA	Ohio-Apex, Inc.
di-2 ethylhexyl Adipate	Adipol 2EH	Ohio-Apex, Inc.
diisooctyl Adipate	Monoplex DOA	Rohm & Haas Co.
dioctyl Adipate	Goodrite GP-233	B. F. Goodrich Chemical Co.
Azelates		
Di 2-Ethyl-Hexyl Azelate	Plastolein 9056	Emery Industries, Inc.
Di cyclohexyl Azelate		C. P. Hall Co.
Di hexyl Azelate	Plastolein 9050	Emery Industries, Inc.
Citrates		
Acetyl Tributyl Citrate		Chas. Pfizer & Co., Inc.
Phosphates		
Octyl diphenyl Phosphate	Santicizer 141	Monsanto Chemical Co.
Trioctyl Phosphate	Flexol TOF	Carbide & Carbon Chemical Co.
Tricresyl Phosphate	Kronitex	Ohio-Apex, Inc.
Tributoxyethyl Phosphate	KP-140	Ohio-Apex, Inc.
Cresyl diphenyl Phosphate	Santicizer 140	Monsanto Chemical Co.
Tricresyl Phosphate		Monsanto Chemical Co.
Phthalates		
Butyl Benzyl Phthalate	Santicizer 160	Monsanto Chemical Co.
Dioctyl Phthalate	Goodrite GP-261	B. F. Goodrich Chemical Co.
Di-2 ethyl hexyl Phthalate	Flexol DOP	Carbide & Carbon Chemical Co.
di-butoxyethyl Phthalate	Kronisol	Ohio-Apex, Inc.
di-capryl Phthalate		Rohm & Haas Co.
Dioctyl Phthalate		Tennessee Eastman Corp.
Octyl-Decyl Phthalate	Hercoflex 150	Hercules Powder Co.
Di-2-ethyl hexyl Phthalate	Dioctyl Phthalate	Ohio-Apex, Inc.
Di-2-ethyl hexyl tetrahydrophthalate	Flexol 8 HP	Carbide & Carbon Chemical Co.
Di-2-ethyl hexylphthalate	Aero DOP	American Cyanamid Co.
Di-iso octyl Phthalate	Aero DOPI	American Cyanamid Co.
Di cyclohexyl Phthalate	Elastex DCHP	Barrett Div., Allied Chemical
Diisooctyl Phthalate	Elastex 10-P	Barrett Div., Allied Chemical
Miscellaneous		
Butyl Phthalyl Butyl Glycolate	Santicizer B-16	Monsanto Chemical Co.
Dioctyl Sebacate		Rohm & Haas Co.
Tetraethylene Glycol Di Isohexoate	Flexol 4-GO	Carbide & Carbon Chemical Co.
	Flexol TWS	Carbide & Carbon Chemical Co.
	Harflex 500	Hardesty Chemical Co., Inc.
	Elastex 50-B	Barrett Div., Allied Chemical

cizers are useful as part of a mixed plasticizer system. Examples of resinous polyester plasticizers are given in Table V.

Stabilizers (29-35): Polyvinyl chloride compositions, when heated to high temperatures, tend to undergo decomposition by loss of HCl composed of a hydrogen and a chlorine atom from adjacent carbon atoms in the chain. This splitting off of HCl, once started, apparently continues along the chain to produce a conjugated system and, accompanying this reaction, the composition becomes progressively darker in color and harder and more brittle. On exposure to light, further deterioration may take place, probably due to oxidation. Since in fusing, high temperatures are always encountered, it is necessary to add stabilizers to prevent heat deterioration and since, in most uses, there is probability of light exposure of the articles manufactured, it is also desirable to stabilize against sunlight. While properties of stabilizers overlap to some extent, some are particularly effective as heat stabilizers and others as light stabilizers so that it is usually desirable to use mixtures of them. In selecting stabilizers a number of factors should be considered. Among these are: (1) reactions with plasticizers used, (2) color imparted, (3) toxicity, (4) opacity. Some of the more common stabilizers are shown in Table VI.

Pigments and Fillers: Pigments and fillers are added to obtain desired colors and opacity and to lower cost.

Surface Active Agents: Surface active agents are often used to improve wetting and to decrease rate of solvation or swelling of the plastic particles.

Miscellaneous Ingredients: To obtain particular properties, special materials are added, such as mold release agents, to facilitate removal from molds, phenolic resins for hot strength, blowing agents for forming sponge, perfumes to impart pleasant odors, and luminescent pigments for decorative effects.

Thinners (4): In the case of organosols and modified plastisols, the choice of thinners or diluents is very important as they control the viscosity and processing properties, as well as the stability of the composition.

Many factors are involved in determining the type and amount of volatile solvents to be used in making organosols. These can be divided into two types, distinct but overlapping in properties. The first consists of ingredients which have some degree of solvating action and aid in dispersing the plastic particles, while the second are inert diluents which aid in lowering viscosity. It is necessary to have a proper balance of the two types because too high a ratio of the solvating type tends to cause swelling of the particles and gelling of the dispersion while too high a proportion of inert diluent tends to give flocculation, high viscosity and poor flow properties.

Since it is desirable to have plasticizers in most organosols and these have solvating action on the particles,

TABLE IV—SECONDARY PLASTICIZERS

Chemical Composition	*Trade Name*	*Supplier*
Chlorinated biphenyl	Aroclor 1254	Monsanto Chemical Co.
Acetylated Methyl Cellosolve Ricinoleate	Staflex IXA	Deecy Products Co.
Petroleum Derivative	Solvaloid C	Socony-Vacuum Oil Co.
Petroleum Derivative	Dutrex 20	Shell Oil Co.
Petroleum Derivative	Dutrex 25	Shell Oil Co.
Liquid Chlorinated Paraffin	Chlorowax 40	Diamond Alkali Co.
Resinous Chlorinated Paraffin	Chlorowax 70	Diamond Alkali Co.
Distilled methyl ester of Tall Oil	Metalyn	Hercules Powder Co.
	Chlorafin 42	Hercules Powder Co.
	Celluflex M179C	Celanese Chemical Corp.
Petroleum Derivative	Panoflex BN-1	Pan American Chemical Corp.
Petroleum Derivative	Panoflex BN-2	Pan American Chemical Corp.
	Baker P-8	Baker Castor Oil Co.
	THFO	Hooker Electrical & Chemical Co.
	HB-40	Monsanto Chemical Co.

they must also be considered in determining the proper balance of ingredients in the volatile thinner. The problem of determining the proper formulation of an organosol so that it has the best viscosity and flow properties and yields fused deposits of the most desirable properties for the particular use without losing sight of the important item of cost becomes rather complicated, and will not be discussed in detail in this paper.

The selection of a thinner for use in modified plastisols, as contrasted with organosols, is simpler in that after a plastisol of the desired finished properties and approximately the desired processing properties is formulated, it is modified for easier handling by reducing the viscosity by addition of a low percentage of diluent. Examples of organic thinners are shown in Table VII.

Mixing

In preparing plastisols, the resin powder is mixed into the plasticizer. In the case of Geon 121 resin, this can be done by merely stirring with equipment which gives positive agitation without grinding, as in pony type or internal mixers. Usually all of the ingredients are charged to the mixer. It is generally desirable to add dry ingredients, particularly colors, in the form of dispersions previously prepared in part of the plasticizer. With most other resins, it is recommended that the mixture be ground to break down the resin agglomerates.

In grinding plastisols, ball mills, pebble mills or attritors give the smallest particle size, but because of faster action three-roll mills are preferable. They are particularly useful for grinding high viscosity pastes. In grinding organosols, three-roll mills are not suitable because of evaporation of solvent and enclosed grinders such as attritors are recommended. Since it is necessary to keep the mix cool, equipment such as colloid mills which generates considerable heat is not generally useful.

TABLE V—RESINOUS POLYESTER PLASTICIZERS

Brand	*Supplier*
Paraplex G-25	Rohm & Haas Co.
Paraplex G-50	Rohm & Haas Co.
Paraplex G-60	Rohm & Haas Co.
Flexol R-1	Carbide & Carbon Chemical Co.
Glyptal 2557	General Electric Co.
Glyptal 2599	General Electric Co.

Deaeration

For many uses, particularly where thick articles are made from plastisols, it is necessary to remove entrapped air or gases from the plastisol to insure perfect products. In the case of low viscosity plastisols, this can be done quite simply by applying a vacuum to the plastisol preferably spread in a thin film as by flowing over a spreading cone. With more viscous plastisols, removal of air is more difficult and it is necessary to use more complicated and expensive equipment such as the Cornell Versator which spreads the plastisol into a thin layer by centrifugal action while a vacuum is applied.

Manufacturing Methods

Plastisols and organosols may be used by a variety of manufacturing methods. They may be applied to paper or fabrics by spreading, spraying, roller coating or brushing. Articles may be coated by dipping. Unsupported articles are made by dipping forms and stripping or by casting in molds. Plastisols or organosols may be used as bases for inks and for making blown sponge.

In any manufacturing process it is essential to include adequate fusion to obtain the best properties of the finished product. This is done by heating to the fusion temperature which varies somewhat with the composition but usually is in the range of 325 to 350° F. Unlike vulcanization, it is not necessary to keep the article at this temperature for any length of time. However, in the case of thick articles it is essential to keep the article at the high temperature long enough to insure that all parts of the article reach the fusion temperature. Adequately fused deposits or articles exhibit toughness and high tensile and tear strength while poorly fused ones, even when having similar appearance, are poor in these properties.

Before discussing the actual procedures used in various manufacturing methods, the factors involved in making a choice between plastisols and organosols should be considered. Since plastisols are free from volatile solvents, the hazards of fire and toxicity associated with them are eliminated. This means savings in insurance rates, and in expense of solvents, explosion-proof equipment and costly exhaust or recovery systems. In addition, the composition of the plastisol does not change nor do skinning or drying out take place due to evaporation of solvent. So lumps are not introduced and drippings from such operations as spreading can be re-used. Since there is no solvent to evaporate, thicker articles or coatings can be made in single instead of multiple operations

TABLE VI—STABILIZERS FOR PLASTISOLS AND ORGANOSOLS

Chemical Composition	Trade Name	Supplier	Recommended Use for Stabilization
	Barium Stabilizers		
Barium 2-ethyl hexoate	Ferro Stabilizer 100	Ferro Chemical Corp.	Heat
Barium ricinoleate	Ferro Stabilizer 120	Ferro Chemical Corp.	Heat
Barium ricinoleate (modified)	Ferro Stabilizer 121	Ferro Chemical Corp.	Heat
Organo-metallic compound containing barium	Stabilizer L	Advance Solvents & Chemical Corp.	Light
Barium ricinoleate		Baker Castor Oil Co.	Heat
	Cadmium Stabilizers		
Cadmium 2-ethyl hexoate	Ferro Stabilizer 200	Ferro Chemical Corp.	Light
Cadmium naphthenate	Ferro Stabilizer 210	Ferro Chemical Corp.	Light
Cadmium naphthenate-2-ethyl hexoate	Ferro Stabilizer 211	Ferro Chemical Corp.	Light
Cadmium ricinoleate	Ferro Stabilizer 221	Ferro Chemical Corp.	Light
Organic cadmium compound dispersed in plasticizer	Stabilizer JCX	Advance Solvents & Chemical Corp.	Light
Organic cadmium compound dispersed in plasticizer	Stabilizer VL-3	Advance Solvents & Chemical Corp.	Light
Cadmium type	Stabilizer No. 21	Advance Solvents & Chemical Corp.	Heat and Light
	Lead Stabilizers		
Monohydrous tribasic lead sulfate	Tribase	National Lead Co.	Heat
Lead orthosilicate and silica gel	Plumb-O-Sil A	National Lead Co.	Heat and Light
Lead orthosilicate and silica gel	Plumb-O-Sil B	National Lead Co.	Heat and Light
Dibasic lead stearate	DS-207	National Lead Co.	Heat
Dibasic lead phthalate	Dythal	National Lead Co.	Heat and Light
Basic lead silicate sulfate	Tribase E	National Lead Co.	Heat and Light
Dibasic lead phosphite	Dyphos	National Lead Co.	Heat and Light
Basic lead salt of 2-ethyl hexoic acid	Ferro Stabilizer 301	Ferro Chemical Corp.	Heat
Lead organo-silicate	Ferro Stabilizer 361	Ferro Chemical Corp.	Heat
	Strontium Stabilizers		
Strontium 2-ethyl hexoate	Ferro Stabilizer 400	Ferro Chemical Corp.	Light
Strontium naphthenate	Ferro Stabilizer 410A	Ferro Chemical Corp.	Light
Strontium compound dispersed in plasticizer	Stabilizer SN	Advance Solvents & Chemical Corp.	Heat
Strontium compound dissolved in ketone solvent	Stabilizer V-1-N	Advance Solvents & Chemical Corp.	Heat
Strontium compound dissolved in high boiling plasticizer type solvent	Stabilizer V-9	Advance Solvents & Chemical Corp.	Heat
	Tin Stabilizers		
Organic tin compound	Stabilizer No. 3	Advance Solvents & Chemical Corp.	Heat and Light
Organic tin compound (liquid form)	Stabilizer No. 52	Advance Solvents & Chemical Corp.	Heat and Light
	Miscellaneous Type Stabilizers		
Sodium organo-phosphate	Ferro Stabilizer 541	Ferro Chemical Corp.	Light
Calcium ricinoleate	Ferro Stabilizer 621	Ferro Chemical Corp.	Heat
Metal-free resinous epoxide	EPON RN-34	Shell Chemical Corp.	Heat
Unknown	Stabelan E	Harwick Standard Chemical Co.	Heat and Light
Unknown	VanStay-H	R. T. Vanderbilt Co.	Heat
Unknown	VanStay-25	R. T. Vanderbilt Co.	Light
Unknown	VanStay-16	R. T. Vanderbilt Co.	Light
Unknown	Staflex QMXA	Deecy Products Co.	Heat
Unknown	Stabilizer A-5	Carbide & Carbon Chemical Corp.	Heat
Unknown	Stabilizer 85	Victor Chemical Works	Light
Calcium stearate		Harshaw Chemical Co.	Heat

without danger of blistering due to solvent. Because a plastisol is 100% solids in the sense that nothing is lost by evaporation during manufacture of articles, practically no shrinkage takes place.

The limitations of plastisols are due to the viscosity and processing properties of systems not containing volatile thinners. In order to formulate plastisols sufficiently low in viscosity to be handled in many processes, it is necessary to use a large amount of plasticizer which may result in too soft a finished article. Organosols or modified plastisols aid in solving this problem by making possible much lower viscosity systems without impairing the properties of the finished article. This is particularly true when a relatively hard product is desired as in some coated metal articles and hard finishes for fabrics. The use of volatile solvents makes possible better penetration of fabrics and also simplifies the adjustment of viscosity as needed during the process. While less economical, it is somewhat simpler to regulate the gauge of coatings using multiple coats with organosols than single plastisol coats.

It is difficult to make general rules as a basis of choice, but in each application contemplated consideration should be given to the above factors before a selection is made. Commercial practice is to use plastisols, modified plastisols or organosols for dipped items, plastisols for molded items, and organosols or modified plastisols for most spreading operations. Wire coating uses about 100,000 lbs. per year of plastic in the form of plastisols, but for harder coatings organosols or modified plastisols may be preferable. As more knowledge is being gained

TABLE VII—THINNERS

Solvating Type Thinners

Toluene, High flash naphtha, Methyl isobutyl ketone	—Low boiling (approx. 250° F.)
Xylene	—Medium boiling (approx. 300° F.)
Solvesso 100, Diisobutyl ketone	—High boiling (approx. 350° F.)

Non-Solvating Type Thinners

Gasolene	—Medium boiling (approx. 300° F.)
Dipentene, Kerosene	—High boiling (approx. 350° F.)

FIG. 1—Automobile seat covers with top and side panels made from fabric coated with a Geon plastisol formulation.

about formulation of plastisols, particularly about plasticizer systems, and as manufacturers are learning how to handle them, the trend is toward the use of more plastisols due to the advantages mentioned.

Coating: In producing coated or impregnated fabric or paper, conventional methods can be used except that thicker coatings may be applied in a single operation than is possible with solution systems and it is necessary to raise the temperature of the coating to the fusing point of about 350° F. The resin paste systems lend themselves well to producing embossed surfaces as they take a good impression (see Figures 1 and 2).

Dipping: In dip coating articles with a relatively thin coating, the article is dipped in plastisol at room temperature, allowed to drain until a uniform coating remains, then fused at about 350° F. The initial viscosity of the plastisol largely controls the film thickness. Continuous coating of wire by this method is very satisfactory. The wire is dipped in plastisol, excess removed by means of a die, and the coating gelled and fused.

Heavier coatings are applied by preheating the part, immersing and allowing a definite interval for a gel to build up on the form, withdrawing, draining and fusing as with a thinner coat (see Figure 3). In this case, in addition to the viscosity of the plastisol, the temperature and heat capacity of the object being coated and the immersion interval are also factors in controlling thickness of deposit. In order to control runs and tears and to obtain a glossy finish, it is sometimes desirable to gel or set up the deposit rapidly. This can be accomplished by immersing the coated part in hot oil, glycerine or wax. If the temperature of the bath is high enough, fusion as well as gelation may be brought about. Usually, however, after sufficient draining the deposit is gelled and fused in an oven. Other sources of heat such as infra-red lamps may be used.

Unsupported articles may be made by a similar process by using suitable forms, provided the shape of the article is such that the film has enough elongation to make stripping possible. The form should be cooled before stripping as the film is tender near the fusion temperature. Gloves are an example of articles which can be made in this way. By the use of modified plastisols or organosols, thin gloves in the range of .008 to .010-inch can be made by this method.

Coating of fabric gloves is a very successful application of a variation of this same process. The glove is mounted on a rough form to stretch the surface and insure uniform coating. It is usually desirable to singe surface fibers with a flame to obtain optimum smoothness of coat. Care must be exercised in the selection of fabrics and glove construction to minimize tendency of the plastisol to penetrate causing stiffness, defectives and difficulty in stripping. The viscosity and composition of the plastisol is also important in preventing penetration or strike through. The gloves are dipped in the plastisol, allowed to drain, fingers down until dripping has ceased and gelled, and fused in an oven with fingers up. Gloves are then stripped. Stripping is greatly facilitated by the use of forms with detachable thumbs.

Molding: There are a number of molding methods

FIG. 2—Cast fabric made from Geon paste resin by L. E. Carpenter & Co., Wharton, N. J.

FIG. 3—Plating rack coated with a Geon plastisol.

TABLE VIII—PHYSICAL PROPERTIES

Tensile (lbs./sq. in.)	1500-4000
Elongation (%)	150-600
Hardness (Shore A)	30-95
Tear (lbs./in.)	145-350
Abrasion Resistance (rev. on Taber Abraser).	<100 mg/1000
Dielectric Strength (volts/ml., ASTM D-149-44)	200-500
Volume Resistivity (ohms/cm.)	0.25-6.0 × 10^{9}

possible by the use of plastisols. One slush molding method involves filling a mold and draining it after allowing a pre-determined period for build up of a deposit on the hot walls of the mold. Porcelain or metal molds are usually used. Aluminum is an excellent material. The molds may be split to facilitate removal of deposits. The process is carried out either by preheating the mold to a definite temperature before filling or by filling at room temperature and heating the mold after filling. In a modification of this process, a measured amount of plastisol is placed in a mold which is then completely closed and rotated on two axes to distribute the plastisol while heating to bring about gelling.

In casting or low pressure molding, a solid mass is desired and the plastisol is loaded into a mold by pouring or injection and then heated to gel and fuse. Longer heating is required in this case for the temperature of the mass to reach the proper level.

Although a relatively new field, injection molding using plastisols is of interest. One novel process *(36)* being used for the manufacture of dolls is a centrifugal injection process in which the plastisol is injected into a cold mold, which is then heated to 375° to 400° F. and spun in a centrifuge to give uniform distribution. The part is removed from the mold by vacuum. It is claimed that the entire cycle from loading the mold to removing the part requires less than 15 seconds (see Figure 4).

Spraying: Preliminary work on spraying of plastisols has given excellent results. It is necessary to use pressure on the plastisol. Indications are that about 2500 cps. is the top limit of viscosity for sprayable plastisols by conventional equipment, but higher viscosity material may be used with high pressure equipment. It may be desirable to preheat the part being spray coated to gel the plastisol and avoid runs in heavy coatings.

Films: Thin films can be made by spreading or flowing plastisol on a cold belt and heating or on a preheated belt, fusing and stripping.

Properties of Fused Deposits

When properly compounded and fused, deposits from plastisols and organosols give excellent physical properties *(3)*. While these may be varied over a wide range, some ranges of typical properties are given in Table VIII.

Chemical resistance properties are, generally speaking, those of polyvinyl plastics, which are excellent, modified by the presence of plasticizers. Extraction of plasticizers gives harder films and contact with materials in the nature of plasticizers causes softening. It is, therefore, necessary to obtain specific data for the compound to be used and the particular conditions under which it is to be used. It is dangerous to generalize; however, Table IX may serve as a rough guide to chemical resistance.

FIG. 4—Puppets made from Geon Paste Resin 121 by Lastic-Plastic of Burbank, Calif. They are flesh-tinted and costumed, as shown.

Conclusion

There is much to be learned about this relatively new field both in compounding and methods of manufacture of articles. However, it is already an important field commercially and promises to grow even more important. Plastisols, modified plastisols, and organosols may be formulated by the user or may be purchased in ready-to-use form from formulators. American Anode, Inc., offers a line of plastisols and modified plastisols. Bulletins *(37)* describing these materials and their proper methods of use are available. Specific problems can be taken up individually.

ACKNOWLEDGMENT

We wish to acknowledge valuable assistance in preparation of this paper from men of the B. F. Goodrich Chemical Co., particularly L. L. Shailer and W. D. Todd.

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TABLE IX—CHEMICAL RESISTANCE

Good in:	Inorganic Acids
	Inorganic Bases
	Some Hydrocarbons
	Alcohols
	Formalin
Fair in:	Cottonseed Oil
	Organic Acids
Poor in:	Ketones
	Esters

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Latex Films as Temporary Protective Coatings for Metal Surfaces

RUBBER films derived from latex have been used as temporary protective coatings for metal surfaces, as in shipping and storage, because their physical properties promote good mechanical protection and ease of stripping, with the advantage that the use of solvent or hot melt is avoided as required by some other film-forming materials. Until recently, however, the use of latex films for such purpose has been confined to non-ferrous metals and enamelled surfaces, due to the fact that the watery content of the latex causes rusting and corrosion of iron and steel.

According to a recent issue of *Rubber Developments*, work carried out at the British Rubber Producers' Research Association laboratories in Welwyn Garden City, England, in conjunction with Dr. Vernon, of the Chemical Research Laboratory of the Department of Scientific and Industrial Research at Teddington, has led to the development of rubber latex compositions which do not have this defect. This is achieved by incorporating in rubber latex substances with corrosion-inhibiting properties, the most effective compounds being sodium benzoate and sodium nitrite added in quite small quantities. Not only are such films non-corrosive in themselves, but will actually resist deterioration under conditions which are normally detrimental, i.e., high-humidity atmospheres.

A 60 per cent latex can thus be rendered non-corrosive and films derived from such a latex have excellent anti-corrosive properties. The self-adhesiveness of such a film may be troublesome in use and it is advisable to substitute a pre-vulcanized or vulcanizable latex, an improvement in aging properties also being obtained.

Having obtained a protective latex of the pre-vulcanized or vulcanizable type, it is necessary to consider methods of depositing a suitable film on the article to be protected. The easiest way of treating small parts is by a simple dipping process, but due to surface tension the liquid flows away from the sharp edges and shoulders, common to many machined parts, leaving thin spots in the dried film. Increasing the viscosity of the latex by the use of thickeners is helpful and one promising method is to render the latex coagulable by heat. The metal part, after heating to 80° to 90° C., is dipped for a few seconds in such a sensitized latex and a coagulated film is obtained which covers the article uniformly. By varying the conditions of dipping different film thicknesses may be obtained to suit the standard of protection required for each particular article. Larger articles and surfaces can be sprayed.

When a pre-vulcanized latex is employed with this technique the operation is complete when the film has dried out. This can conveniently take place under normal atmospheric conditions. With a vulcanizable latex a slightly elevated temperature may be required to effect drying and vulcanization in the same operation.

Initially, tests on the anti-corrosion properties of latex films containing sodium benzoate and sodium nitrite were carried out in water saturated atmospheres at room temperature and remarkable resistance to corrosion was found. Similarly, specimens, when kept under normal conditions of temperature and humidity in the laboratory in England for 12 months, show no sign of deterioration. Uncoated steel parts stored as controls were completely corroded in three weeks due to corrosive elements in the laboratory atmosphere. Trials under the more severe tropical conditions were carried out in Malaya with completely satisfactory results to date.

Although the resistance of these films to atmospheric corrosion is of high order, it should be noted that actual immersion in water will result in the leaching out of the inhibitors, which are water soluble, with consequent loss of protection. Furthermore, it should be emphasized that chlorides and other inorganic salts interfere seriously with the action of the inhibitor and should therefore be avoided.

Electrical Resistivity of Various Carbon Blacks in Natural, GR-S, Cold and Butyl Rubbers

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The accumulation of static electric charges on objects insulated from "ground" by a rubber medium has presented many problems to the rubber technologist during the past two decades. Because of the nuisance and hazard associated with this phenomenon the problem has been studied by many investigators and the results of a good many of their researches have been published. However, since certain of the more practical aspects of the problem have not been fully discussed in the published literature the work reported in this paper was undertaken.

The effects of black dispersion, type of black, type of rubber, and flexing action upon electrical resistivity were studied as was the relationship between surface and volume resistivity. Various types of black covering in brief the broad carbon spectrum were studied. Natural, GR-S, butyl and cold rubber were evaluated.

The degree of milling has a major effect upon electrical resistivity of certain blacks (e.g., Philblack A) but has a relatively negligible effect upon others (e.g., Philblack O, acetylene black). Resistivity decreases with an increase in black loading for all blacks studied. The type of rubber employed exerts a pronounced effect, with the resistivity decreasing in the following order: cold rubber, GR-S, natural rubber and butyl rubber. Surprisingly, the conductivity is only slightly affected by flexing which is contrary to the generally accepted idea. It is postulated that differences in electrical properties of various polymers may be attributable to the degree of dispersion of the carbon black inherent in the particular polymer. Surface and volume resistivity results are similar.

DURING the past two decades, problems pertaining to the electrical conductivity of rubber products have become increasingly important. The difficulties have become manifest in many ways but attention has been focused on the problem primarily because of two factors: (1) bad radio reception in moving automobiles, and (2) undesirable electrical shocks occurring to persons acting as a "ground" to objects which had built up a large electrostatic charge. These static electrical charges, built up on rubber conveyor belts, rubber floors, rubber tired vehicles, etc., have been both annoying and dangerous and consequently considerable work has been expended in studying the problem and its solution.

A cursory search of the literature reveals several very fine articles dealing with various phases of the problem. Methods for determining the electrical conductive characteristics of rubber mixes have been reported by Lane and Gardner (*3*), Cohan and Mackey (*1*), Robinson (*5*), Habgood and Waring (*2*), and others. Detailed studies of the static electrical charge build-up on vehicles and tires have been made by Liska and Hanson (*4*) and Lane and Gardner (*3*), and these and other investigators have shown that undesirable high potential static charges may be minimized or eliminated by the use of electrically conductive rubber.

In general, rubber compositions having electrical resistivities above 10^7 ohm centimeters are relatively poor conductors which favor the accumulation of static charges while compositions having resistivities lower than 10^7 ohm centimeters are classed as electrically conducting rubbers. Rubber insulators have electrical resistivities in excess of 10^{13} ohm centimeters.

Although considerable work has been reported on the effects of various factors affecting test methods, a smaller amount of work is available which shows the effects of black type, rubber type, degree of black dispersion, and flexing upon electrical resistivity. Consequently, the work reported in this paper was undertaken to determine the effects of the above mentioned variables and also the relationship existent between volume and surface resistivities.

The investigation of this latter point was prompted by the observation that inner tubes undergo surface crazing when mounted in casings. It was postulated that EMF differences of great magnitude are built up as a result of the flexing action of the casing and tube and when this charge is dissipated minute quantities of ozone are generated which attack the surface of the tube. It was also observed that in certain instances the inner tube might actually be punctured as a result of the electrical discharge.

Test Methods

Standard test devices for measuring electrical resistivities were employed. Measurements were made in most cases on rubber slabs 6″ x 6″ x 0.080″ although in a few instances slabs of dimensions 3″ x 3″ x 0.250″ were employed. All specimens were conditioned at 80°F. and 45% relative humidity for a minimum of 24 hours before testing. In order to reduce the contact resistance effect, the test specimens were painted with Aquadag before testing. Guarded ring electrodes were employed.

Effect of Black Type and Degree of Milling on Electrical Resistivity

It has been reported by several investigators that the degree of dispersion of carbon black in the rubber matrix has a marked effect upon ultimate conductivity characteristics but little data have been published showing the exact magnitude of the effect. Since this factor may at times be significant enough to transpose a rubber composition from the conducting to the insulating class, it was felt that a rather thorough investigation of it would be very desirable. Consequently various blacks were selected for study which supposedly would result in compounds varying from good conductors to good insulators and a sampling procedure was set up which would en-

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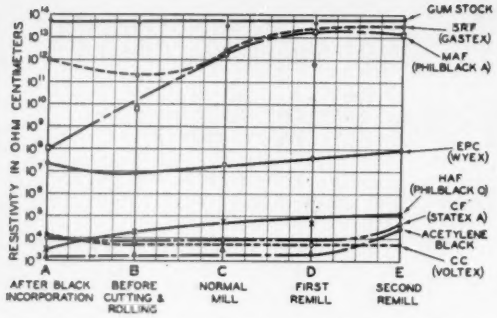

FIG. 1—Effect of milling on electrical resistivity.

sure black dispersions ranging from poor to excellent. A resumé of the sampling procedure is shown below for an 8X batch milled on a standard 6″ x 12″ laboratory mill:

Sample A—Taken one minute after all the black had been incorporated.

Sample B—Taken three minutes after all the black had been incorporated.

Sample C—Taken after the batch had been cut six times at twenty second intervals then rolled endwise three times.

Sample D—Taken after a hot remill (one tight pass plus one and one half minute of milling).

Sample E—Taken after the cold remill (two tight passes plus approximately three minutes of milling to give a total time of 5 minutes of remill).

SRF (Gastex), CF (Statex A), CC (Voltex) EPC (Wyex), acetylene black, MAF (Philblack A) and HAF black (Philblack O) were evaluated in the following base recipe:

GR-S	100.0
Black	50.0
Zinc Oxide	3.0
Softener	6.0
Sulfur	1.75
Accelerator	0.8

A gum stock was also included for comparative purposes. Test specimens were cured 30 minutes at 307°F.

The effect of milling time upon electrical resistivity is shown in Figure 1. The degree of mixing, over the range investigated, has little effect on the electrical conductivity of the HAF, EPC, CF, CC and acetylene black stocks but the MAF black stock varies from a good conductor to an excellent insulating compound as the mixing time is increased. It will be noted that after the second remill, the resistivities of the HAF, EPC, CF and acetylene black stocks all increase somewhat whereas the conductive channel black stock is not so affected.

These data indicate that a good conducting black is capable of withstanding a great deal of shearing action in the elastomer matrix without materially lowering its conductive characteristics but that compounds reinforced with larger particle size furnace blacks undergo rapid change from good conducting to good insulating stocks as a result of further mixing. The results of this work indicate how certain blacks may be used equally well in conductive as well as insulating compositions.

Effect of Black Loading on Electrical Conductivity

The effect of varying the black loading of Philblack A and acetylene black from 0 to 75 parts per hundred parts of rubber in the same basic formula given in the previous section is shown in Figures 2 and 3 respectively. In addition, the effect of the degree of mixing as discussed in the previous section is also shown.

Both of these figures reveal that even though a black may be a good electrical conductor more than 10 parts per hundred parts of rubber are required in order to impart any appreciable conductance to the compound, and that as the black loading is increased above 10 phr the electrical conductivity also increases. It is apparent also that the degree of mixing affects both blacks at most loadings studied but that the effect is least pronounced with acetylene black.

Effect of Elastomer Type on Electrical Resistivity

Today the rubber technologist has his choice of three general purpose rubbers—natural, standard GR-S and low temperature GR-S—and several specialty purpose rubbers for meeting various service requirements. Since butyl rubber is widely used in truck and passenger car inner tubes and since the electrical conductive characteristics of the inner tube undoubtedly influences the ac-

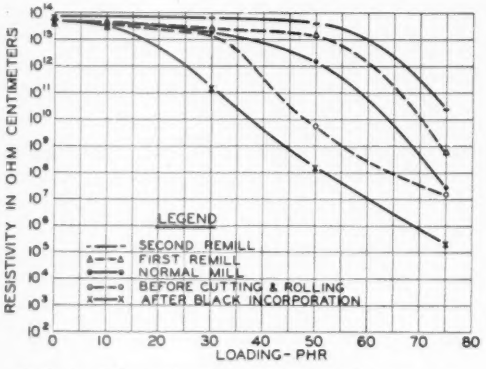

FIG. 2—Effect of milling and black loading on electrical resistivity (Philblack A).

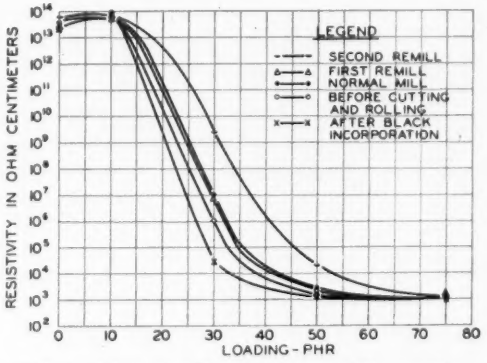

FIG. 3—Effect of milling and black loading on electrical resistivity (acetylene black).

TABLE I—ELECTRICAL RESISTIVITY OF VARIOUS RUBBER CARBON BLACK COMBINATIONS

(Megohm Centimeters)

	Natural	GR-S	Cold	Butyl
MAF (Philblack A)	17.4	158,000	284,000	.0094
HAF (Philblack O)	0.089	0.108	270.2	———
Acetylene black	0.0025	0.0051	———	———
CC (Voltex)	0.0068	0.0063	———	———
EPC (Wyex)	33.9	63.16	38,150	———
SRF (Gastex)	34,400	236,000	———	———
Gum Stock	10,100,000	60,000,000	———	10,450,000

cumulation of static electricity on automobiles, it was decided to study this elastomer along with the three general purpose rubbers. The results shown in Table I were obtained in tread type recipes containing 50 parts of black per hundred parts of rubber. In most instances the values shown were obtained by averaging the results of three separate investigations.

A study of Table I reveals that cold rubber gives stocks which are slightly less conducting than GR-S stocks which in turn are slightly less conducting than natural rubber stocks. Butyl rubber is markedly superior to the other rubbers in contributing to excellent conductivity in black loaded compounds, but is similar to the other rubbers in gum stocks.

The trend in results is probably due to varying black dispersion in each of the rubbers. Since butyl rubber is quite thermoplastic, less grinding action on the carbon black is exerted by this rubber than by the other rubbers and hence the black dispersion probably is poorer. Similarly, cold rubber exerts a greater grinding action than the other rubbers thereby promoting better carbon black dispersion and increasing the electrical resistivity of the resultant compound.

The resistivity results for the various Philblack A and Gastex stocks differed quite markedly, which is not surprising, since the previous section has shown that these blacks are greatly affected by the amount of milling and degree of black dispersion. Resistivities ranged from 158,000 to 16,000,000 megohm centimeters for Philblack A in GR-S and from 236,000 to 40,000,000 megohm centimeters for Gastex in GR-S. Similar variations were noted for these two blacks in natural rubber.

Effect of Flexing and Relaxation on Electrical Resistivity

It is the consensus of opinion among rubber technologists that conduction of electricity through rubber carbon black mixes is due principally to the ability of the carbon black to form chains or agglomerates in the rubber matrix. This carbon black network within the rubber matrix acts as the conducting medium for the dissipation of the static electricity. It is also generally surmised that flexing or working action disrupts or breaks these chains thereby resulting in a lowering of the conductive property of the compound. With this in mind most laboratories employ elaborate precautions to ensure a minimum of bending or flexing of the specimens prior to testing.

A study was made to determine if various types of carbon black differed in their ability to withstand flexing action without impairing the conductivity characteristics. It was anticipated that conductivity would decrease with flexing and that a rest period or period of relaxation after flexing would partially restore the conductivity characteristics. Various blacks were evaluated in a natural rubber tread type recipe and the results are shown graphically in Figure 4. DeMattia test specimens 3″ x 6″ x 0.25″ were used in this study and flexing was accomplished by inserting the test specimens in the DeMattia machine and bending through a 180° angle for 2,600 and 15,600 times respectively. The specimens flexed 15,600 times were retested after 1 and 7 days of resting at room temperature.

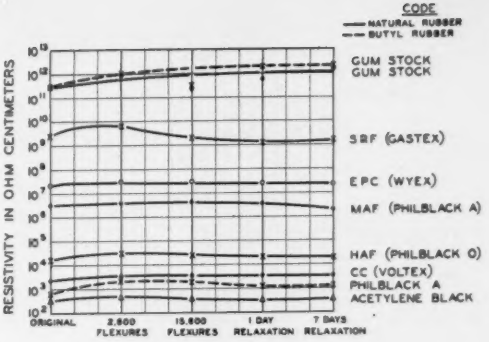

FIG. 4—Effect of flexing and relaxation on electrical resistivity.

A glance at Figure 4 reveals that flexing of the test specimens has a small deleterious effect upon electrical conductivity but not the major effect that was anticipated. After relaxation the test specimens regain to a large extent the slight loss in conductivity incurred as a result of flexing. Butyl and natural rubber behave similarly in this respect.

Surface Versus Volume Conductance

As previously mentioned, crazing of inner tubes has been noted in certain instances where the tubes were inserted in poorly conducting tires. It was postulated that the crazing might be due to electrical discharges occurring at the interface of the tube and casing. This would indicate that the static charge was generated as a result of movement between the tube and casing and that the surface resistivity must be of the same order of magnitude as the volume resistivity since the electric charges were discharged at the interface.

In order to check this point the various compounds discussed in the previous section were vulcanized in 6″ x 6″ x 0.080″ slabs and the surface and volume resistivities were determined on the same slabs. The results of this work are reported in Table II. The data in the table show that, in general, the surface conductivity is slightly poorer than the volume conductivity but that both sets of values are of the same order of magnitude.

TABLE II—SURFACE AND VOLUME RESISTIVITIES

(Megohm Centimeters)

Black	Surface	Volume
Natural Rubber		
MAF (Philblack A)	5.11	1.22
HAF (Philblack O)	1.23	0.05
Acetylene Black	0.009	0.0007
CC (Voltex)	0.111	0.008
EPC (Wyex)	108	35
SRF (Gastex)	5390	69.9
None	2,020,000	10,100,000
Butyl Rubber		
MAF (Philblack A)	0.017	0.009
None	1,620,000	10,450,000

Conclusions

The results of this work show that the degree of milling of rubber carbon black mixes has a major effect upon electrical resistivity of intermediate and large particle size furnace blacks but has a relatively negligible effect upon fine particle size furnace and channel blacks. This point should be considered when processing specifications are established for conducting or insulating compounds since an improper specification might transpose a conducting to an insulating compound or vice versa. As the black loading is increased the conductivity characteristics improve and the effect of the processing variable is minimized.

The type of rubber exerts a pronounced effect upon the conductivity characteristics of black reinforced compounds. This effect is probably related to the degree of dispersion of the black in the elastomer which in turn is undoubtedly affected by the viscosity characteristics (thermoplasticity) of the rubbers at elevated mixing temperatures. Butyl rubber imparts excellent conductivity characteristics when reinforced with MAF black, which should contribute to lower static charge accumulation on vehicles equipped with butyl rubber inner tubes.

The popular conception that flexing of rubber specimens markedly lowers their conductivity by the mechanism of rupturing the carbon black chains in the rubber matrix has not been confirmed. Flexing may increase the resistivity characteristics slightly but the magnitude of the increase is much less than would be anticipated from past beliefs. The magnitude of the effect is similar for all blacks whether they are good or poor conductors.

Experiments comparing surface to volume resistivity show that the two are of the same order of magnitude. Consequently, it is highly probable that electrostatic charges built up by movement of an inner tube in a tire casing may be discharged at the interface of the tube and casing. Such a discharge at the interface could be the cause of surface crazing of inner tubes since traces of ozone might be formed as a consequence of the electric discharge.

ACKNOWLEDGMENT

The authors wish to express their appreciation to the many people who contributed to the development of the data and to Esther Glendinning and J. A. Tallant for their many helpful suggestions in the preparation of the manuscript.

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Rubber Manufacturing Activities in Various Countries

ADDITIONAL reports on rubber manufacturing activities in various foreign countries, compiled by the U. S. Commerce Department from miscellaneous sources, including embassies and consulates, follow herewith:

Italy: Italian production of rubber goods, which had been retarded during the first half of 1949 by power shortages and other causes, increased substantially in the last half of the year to an estimated 65,000 metric tons, of which approximately 39,000 tons were tires. This total output was well above the 1947-48 and 1938 levels. It is estimated that the current rate of production will continue and perhaps increase during the first 6 months of 1950.

Imports of raw materials during the past year approximated those of 1948 and were adequate, with stocks on hand, to meet the industry's increased output. The consumption of natural rubber, estimated at 31,000 metric tons, increased slightly over the preceding year.

Exports of tires and tubes, estimated for 1949 at 7,000 tons, were only a little below those of 1948 which had slightly exceeded the 1938 level. Domestic and export prices remained fairly firm with only a slight tendency, at the close of the year, to decrease.

New Zealand: A growing shortage of tires of all popular sizes for both automobiles and trucks recently has become acute in New Zealand. The shortage has arisen from the premature restrictions on import of tires before local factories had attained sufficient production to meet all requirements. The development of a shortage was anticipated by tire manufacturers near the end of 1949 with the result that the Customs Department granted import allocations in mid-January, 1950, on British Commonwealth countries (except Canada) to the extent of one-third the value of licenses granted in 1949 from those sources. However, the allocation was available only until the end of March. Tire dealers believe the validity of the allocation might be extended inasmuch as no tires were expected to be landed before the end of March, and imports within the specified period would be inadequate.

The shortage is not expected to last long. Of the three tire companies, one is already in full production and the second is reported to have passed the half-way mark and full production by June is anticipated. The third company expects to reach capacity by mid-year. The training of employees, rather than a labor shortage, is understood to be the chief reason for delay in reaching full production.

Brazil: Brazilian tire makers in the first 11 months of 1949 produced 1,059,492 tires, of which 517,812 were for trucks, buses, tractors, earth movers, and airplanes, and 541,680 were for passenger cars and motorcycles. The total 1948 production figure was 994,396, of which 491,146 were for trucks, buses, tractors and the like, and 503,250 were for passenger cars and motorcycles. In the first 11 months of 1949, total output of tubes was 693,527 compared with 744,309 in the full year 1948.

Although tire production in 1949 showed a considerable increase over 1948, the industry's 1949 production goals of 1,200,000 tires and 900,000 tubes probably were not reached. Industry estimates for 1950 are 1,480,000 tires and 1,184,000 tubes. Prospects for actual production in accordance with these estimates employing the increased manufacturing capacity seem fairly good.

Instruments Pay Their Way on Automotive Tire Vulcanizing Equipment

Experience of Dunlop Tire of Canada Indicates Reduced Labor Costs, Increased Production, and Improved Product Uniformity

By F. G. REID

Manager, Engineering Design, Dunlop Tire & Rubber Goods Co., Toronto, Ont., Canada

as told to

CHARLES W. COVEY

Taylor Instrument Companies, Rochester 1, N. Y.

VULCANIZATION or curing is perhaps the most important step in the processing of automotive tires. Both physical and chemical reactions occur to convert the raw rubber to a tough industrial product. Temperature, pressure, and time of processing must be carefully controlled to achieve maximum efficiency of vulcanization. Industrial controllers have contributed in a large measure to more successful processing by maintaining these variables within required limits.

As the rubber manufacturing industry well knows, vulcanization is the last major operation in the manufacture of a tire. After the tire has been built up and the airbag inserted the uncured tire is placed into a steel mold shaped to give the tire its final dimension and tread design. These molds are placed into heaters or autoclaves where vulcanization occurs. Smaller size automobile tires are usually cured in presses or heaters accommodating one or two tires, while large size truck and industrial tires are generally cured in heaters with a capacity for as many as 14 tires. This article describes the instrumentation and operation of one of the giant 14-tire autoclaves at the Toronto plant of the Dunlop Tire & Rubber Goods Co., Ltd.

The cure cycle is primarily a carefully controlled heating process. Hot water under pressure is present in the inner bag during the cure to force the tire against the mold and aid heating, while steam is circulated around the outside of the mold so as to provide uniform heating of the tire. When the cure cycle is completed the tire and molds are chilled with water and the tire is removed for finishing.

Fallacies of Manual Control

Before Dunlop applied automatic controls to their pot heaters all operations were manually conducted. The sequence and duration of the various phases of operation were timed and performed by each individual operator, which meant that there were inevitable delays and variations in the production schedule. Equipment maintenance was an expensive production cost, because operators often turned the wrong valve at the wrong time, damaging pumps and upsetting the hydraulic system. The human error was always present and always a problem.

Then automatic controls were applied (See Fig. 1). Every pot heater was put on a definite schedule, being maintained by a Taylor Flex-O-Timer time cycle controller at the optimum period for the type of tires being vulcanized. The temperature was automatically controlled and the sequence of valve operation was put on a fixed time basis in relation to other process variables. The obvious result was uniformly processed tires. The savings brought about by decreased rejects alone paid for the instrumentation in a relatively short period of time. In addition, equipment maintenance cost dropped sharply and production was increased because of the more efficient operation of each pot heater. Operators had to spend less time with details of the heater opera-

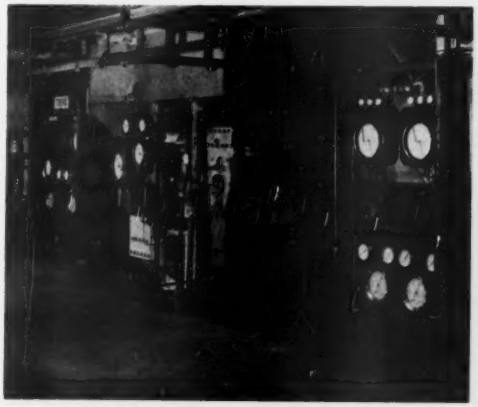

FIG. 1—Portion of the automatic control instrumentation employed on autoclave heaters at the Dunlop Toronto plant.

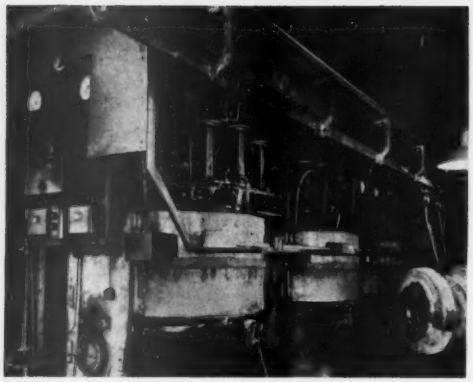

FIG. 2—Battery of steam box type vulcanizing heater presses used by Dunlop for processing automobile tires. A time cycle controller on each press controls the sequence and duration of the vulcanizing cycle.

tion and consequently could devote more time to other duties. It is easy to understand why the management of this plant says that these heaters will never again be operated by manual control.

Complete Automatic Control

As seen in Fig. 4, two Taylor Flex-O-Timer instruments regulate the sequence and duration of all operations involved in the curing cycle, while a Fulscope double-duty temperature controller maintains the proper processing temperature. The advantage of having two timers on each heater is to provide more flexible and trouble-free operation. One timer controls all operations at the beginning of the cycle until a leak test procedure is completed, and then automatically transfers control to the second timer if no leaks are indicated. If only one timer were used it would be necessary to subject all process equipment to an unnecessary, and oftentimes damaging, operation in order to restart the cycle, as is required if a leak occurs. The dual timer control system eliminates this undesirable feature which means reduced equipment maintenance.

Once the operator loads the heater with tires and checks for leaks the entire cycle is controlled by the instruments. At the end of the cycle the operator is signaled by the timer and the tires are ready to be removed. The timer automatically positions itself for the next cycle. By pushing the start button the next cycle begins automatically.

The application of automatic controls to these autoclave heaters, with a definite schedule of operations, has made it possible to stagger the cycle of each heater so that hydraulic and hot water demands do not vary from momentarily excessive highs to zero. Since all units are served by central hydraulic and hot water systems, this means the service required of either at any one time never exceeds the needs for one heater. Previous to the application of controls it was possible to have need for service at several heaters at one time, thus putting a heavy strain on the hot water and hydraulic equipment.

The Vulcanizing Cycle

Unvulcanized tires are placed into individual steel molds which are stacked one on top of the other in the autoclave as shown in the schematic diagram of Figure 4. The rubber bag inside each tire is connected to an external steam and water line by copper tubes and then the lid is closed on the autoclave. By operation of the hand valve HV-21 the operator allows 300 psig hydraulic pressure to raise the ram in the heater which compresses the molds. Hand valve HV-21 is also used to unload the 600 psig hydraulic when the cure cycle is completed.

Test and Preheat Period: The operator pushes the start button and the cycle begins. Immediately the number 1 solenoid in Flex-O-Timer T-12 is energized and the timer motor starts. As the timer cam rotates, air valve 2 is opened which supplies 25 psig air to open hydraulic valve CV-7 and test valve CV-13. Opening of the hydraulic valve allows 600 psig hydraulic pressure to be exerted on the ram of the heater. Very shortly thereafter air valve 3 is opened by the cam action to supply 25 psig air to open pre-steam valve CV-15 and close drain valve CV-14. High pressure steam then enters to warm the unvulcanized tires and mold quickly. This procedure also allows the operator to conveniently check for leaks. If a leak is present in the bag or at the bag connection, steam from inside the bag passes out through the leak and into the heater and escapes through the open test valve CV-13, the outlet of which is located near the heater on the operating floor.

In case of a leak, the operator opens the test switch (shown on Fig. 3) and rotates the cam of timer T-12 back to the starting position. This insures that the cycle will progress no further. When the leak is repaired the operator closes the test switch and pushes the start button and the new cycle is started.

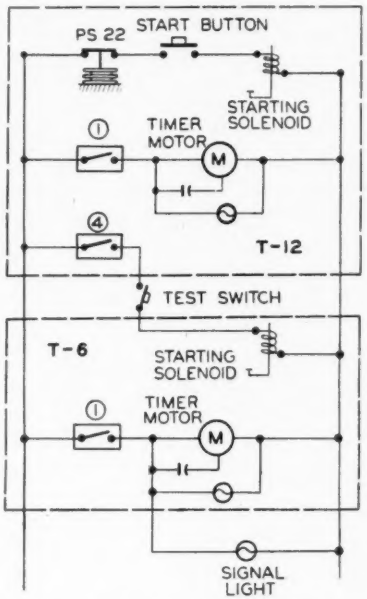

FIG. 3—Schematic diagram of electrical circuit for the two Flex-O-Timer time cycle controllers shown in Figure 4.

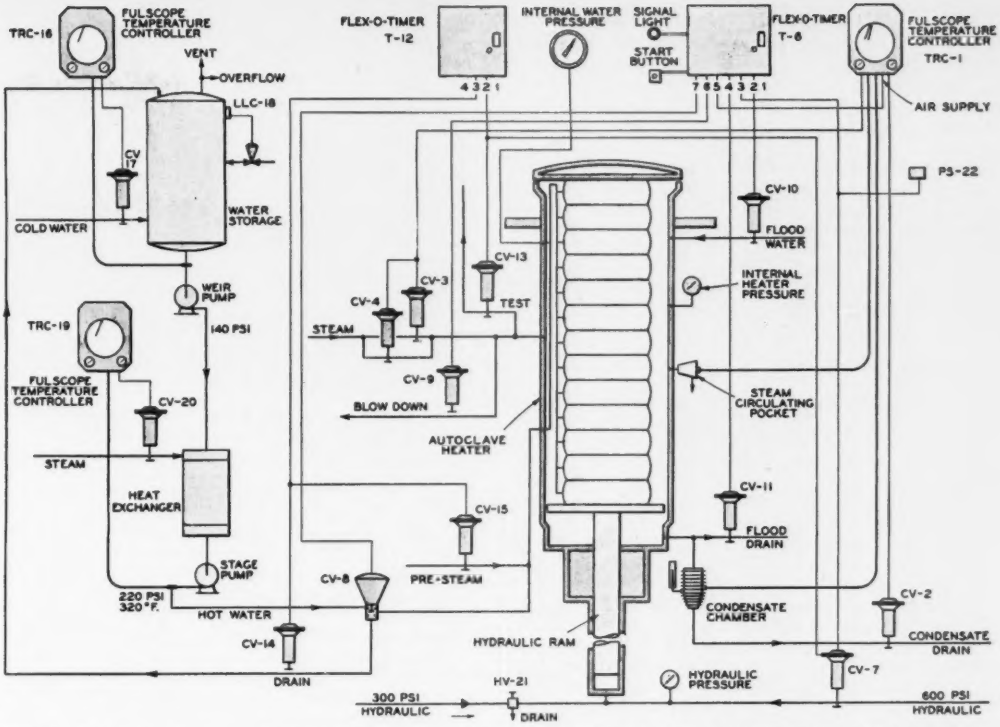

FIG. 4—Schematic diagram of automatic control equipment on autoclave heaters used for vulcanizing heavy automotive tires at the Dunlop plant.

If no leaks appear, the pre-steam period progresses the required time, at the end of which air valve 3 closes thus closing pre-steam valve CV-15 and opening drain valve CV-14. At the same time electrical switch 4 is actuated by the timer T-12. This action starts timer T-6, the other timer still operating.

Within a few minutes after timer T-6 starts, its cam trips number 3 air valve which admits air to the top of hydraulic valve CV-7. At the same time, air valve 7 is actuated which allows CV-8 to close the drain line and open the hot water line to the tire bags. In quick succession the following actions occur in timer T-12: switch 4 opens, air valve 2 closes, and switch 1 opens and the timer stops in the starting position. Air valve 3 in timer T-6 operates hydraulic CV-7, now that air is off from air valve 2 in T-12, and causes pressure switch PS-22 to open. This makes the start button of T-12 ineffective throughout the remainder of the process cycle.

Curing Period: The cycle is now being controlled by Flex-O-Timer controller T-6. After timer T-12 stops, air valve 5 in T-6 opens to supply air to controller TRC-1. This double-duty controller regulates steam valves CV-3 and CV-4 and condensate valve CV-2 so as to maintain temperature in the heater according to the control point required. The usual temperature for larger size tires is 292°F. with condensate being discharged if the temperature drops below 282°F. The heater is under 40 psi pressure while the hot water in the bags is at 220 psi and 320°F. The length of the cure time is determined by the setting on time dial in timer T-6. By adjusting this dial the cure time may be varied according to the requirements for different types of tires.

Blow-down and Cooling: At the end of the cure period timer T-6 actuates air valve 5 which cuts off air supply to the controller thus closing the steam valves and the condensate valve. At the same time air valve 6 opens which allows blowdown valve CV-9 to open for about 3 minutes to relieve internal pressure. As soon as the blowdown valve CV-9 is closed, air valve 2 is opened by the timer which in turn opens the flood water valve CV-10 and cold water sprays over the molds to cool them down to temperature for handling. At the same time drain valve CV-11 is opened by air valve 4 allowing the spray water to drain from the heater.

After a period of five minutes the flood valve is closed. When flood water action has ceased, air valve 7 closes which shuts off hot water to bags and opens water drain by action of CV-8. Very shortly the flood drain valve CV-11 is closed, hydraulic valve CV-7 is closed and the timer stops by action of electrical switch 1. The top of the heater is removed and the molds taken out. The tires are then removed from the mold and put through a finishing operation.

Hot Water System

In order to have properly heated water for admission to the bags it was necessary to install several controls as shown at left in Fig. 4. Internal bag water, varying between 190° and 240°F., is returned to the water storage

tank which is vented to atmosphere. In order to prevent boiling in the storage tank and also to assure a constant temperature of discharge water from this tank, Fulscope Controller TRC-16 is employed to maintain the temperature at 185°F. The controller, whose thermal element is located in the storage tank outlet line, regulates flow of cold water so as to maintain the proper outlet temperature.

A weir pump takes water from the storage tank and steps up the pressure to 140 psig before it enters a heat exchanger. From this the water passes through a second pump which boosts the pressure to 220 psi, the pressure at which the water enters the tire bags. Fulscope Controller TRC-19, with its thermal element located just downstream of the second pump, maintains the high pressure water at 320°F. by regulating the amount of steam flowing to the heat exchanger.

Instrumentation on Other Curing Presses

In addition to the autoclaves for processing large size industrial tires, Dunlop uses a Taylor Flex-O-Timer Controller on each of the smaller steam box type curing presses used to vulcanize automobile tires (Fig. 2). The timers control the sequence and duration of the processing cycle on an automatic basis just as the operations on the larger autoclave heaters are controlled. In this case, too, automatic controls have enabled more efficient utilization of labor and equipment with the resultant improvement in quality and quantity of production.

Dunlop also manufactures bicycle tires at the Toronto plant and again relies on Taylor controls for the maintenance of proper processing conditions on the battery of vulcanizing presses (Fig. 5). Flex-O-Timer and Fulscope controllers are employed to control both temperature and sequencing of operations required to vulcanize the numerous sizes of bicycle tires.

Conclusion

The management of the Dunlop Toronto plant, have, as hundreds of other rubber product manufacturers the world over, specified Taylor controllers for application on rubber processing equipment. In each case where controllers have been applied the improvement over manual operation is so pronounced and outstanding that it is easily understood that automatic controls are standard equipment on vulcanizing equipment today.

In the mass production of a consumer item such as automotive tires the maintenance of quality in each tire is essential. Automatic controls are assuring rubber manufacturers that every item is uniformly processed because they guard each step of the vulcanizing operation with an unbiased eye. Every tire and tube vulcanized gets the same treatment. The chance for human error to upset the schedule is essentially eliminated. Higher quality, greater uniformity, and increased production are the direct results of automatic controls in the rubber manufacturing industry.

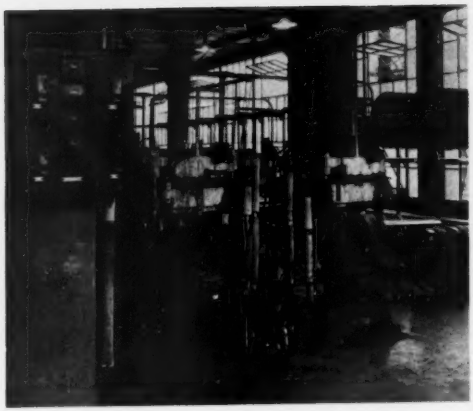

FIG. 5—The four Flex-O-Timer instruments seen at the left maintain the processing cycle for vulcanizing bicycle tires on the presses in the background.

Regulations for the Safe Operation of Vulcanizers

THE following regulations for the safe operation of vulcanizers appeared in a recent issue of the Rubber Section Safety Newsletter of the National Safety Council:

1. Only authorized vulcanizer operators shall operate them.

2. Never operate a vulcanizer unless you are thoroughly familiar with all safety devices and the operation thereof.

3. Test the pop valve at the start of each shift.

4. In case any valve, gauge, safety device, or door locking equipment is not in good repair, report the matter immediately to your foreman, and never operate a vulcanizer until necessary repair is made and approved by him.

5. Report any and all defective pipes or leaks to your foreman.

6. When placing tracks for vulcanizer trucks, see that they are firmly locked in place.

7. Make sure the vulcanizer door is securely locked before turning on steam or air. On bolted door vulcanizers, make certain that all bolts are properly positioned and securely fastened. Never leave out one single bolt of any bolted-door type vulcanizer. Also, make sure that lugs are fully matched.

8. Where recording chart instruments are provided, do not depend on setting the cam. In addition, always shut off the steam inlet valve when finishing heat.

9. The pressure gauge will not register pressure below one pound. Unless pressure is fully released, the vulcanizer may still be under pressure of one pound or less per square inch; therefore, always wait until no steam or air is coming out of the tell-tale valve and until the whistle valve has stopped blowing before unlocking or opening the door.

10. Be certain that the vulcanizer is properly drained of water before the door is unlocked.

11. Any back-pressure within the vulcanizer should be reported to your foreman.

12. Always avoid standing in such a position at the door that steam or hot water may burn you.

13. Never release any safety device on a vulcanizer door until all pressure is entirely removed from the vulcanizer. Check through the tell-tale valve on the door.

The Vulcanization of Neoprene

By A. M. NEAL

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NEOPRENE, unlike natural rubber or any of the other synthetic rubbers, is capable of being vulcanized without the addition of any curing agents or accelerators *(2)*. For practical vulcanizates, however, metallic oxides—normally combinations of zinc oxide and magnesium oxide—are always employed as curatives *(1)*, and for some applications additional accelerators have proven desirable. Although it has been established that catechol *(3, 5, 6)* and its derivatives are powerful accelerators for the vulcanization of neoprene, nevertheless there are requirements for accelerators which will produce somewhat different results. The introduction of Neoprene Type W which requires the use of organic accelerators in order to develop the maximum properties in its vulcanizates has increased the necessity of extending our knowledge of the use of accelerators in neoprene compounding.

One logical approach to a systematic development of new accelerators is to draw on previous experience with those which have been successfully used in the vultanization of natural rubber. Torrence and Fraser *(6)* used this approach to a limited extent and among the compounds which they tested was the important rubber accelerator, mercapto benzothiazole. Their tests showed, however, that this material was a retarder rather than an accelerator of the vulcanization of Neoprene Type GW. In spite of this background a number of other compounds which are closely related to mercapto benzothiazole from a structural standpoint were examined.

The compounds selected for testing were benzothiazyl disulfide; 2 mercapto thiazoline; thiocarbanilide which, although not too closely related structurally to mercapto benzothiazole, is always considered by the rubber technologist to be related to it since he considers it to be a forerunner of that accelerator; 2 mercapto benzimidazole*, which, from a chemical standpoint, is closely related to thiocarbanilide and, from a structural standpoint, somewhat resembles mercapto benzothiazole; and 2 mercapto imidazoline*. These chemicals were tested in the following Neoprene Type GN formulation:

Neoprene Type GN	100
Phenyl Alpha Naphthylamine	2
Extra Light Calcined Magnesia	4
SRF Carbon Black	29
Zinc Oxide	5
Accelerator	1

The stocks were cured for 20 minutes at 307° F. and the results obtained with the accelerators tested are shown in Table I.

The data show conclusively that judged by the effect on modulus only 2 mercapto benzimidazole and 2 mercapto imidazoline are accelerators. 2 mercapto thiazoline and thiocarbanilide are essentially neutral at curing temperatures though other tests have indicated that both materials tend to make the stocks scorchy as judged by the Mooney scorch test. Benzothiazyl disulfide, like mercapto benzothiazole, is a definite retarder of vulcanization. Although this series of tests failed to disclose any definite pattern, either structural or chemical, which would further our knowledge of what type of compounds would be accelerators for the vulcanization of neoprene, it did lead to the discovery of a compound, 2 mercapto imidazoline, which appears to have considerable practical promise. Accordingly, a more detailed study of the action of this material was undertaken†.

The first properties of this new accelerator which were considered were the processing safety of stocks containing it and the relationship between activity and accelerator concentration. These tests were carried out in a typical Neoprene Type GN stock containing twenty volumes of a semi-reinforcing type of carbon black. The results obtained are shown in Table II and plotted

TABLE I

Compound Tested	Stress at 300%	Tensile Strength	Elongation
Control (no accelerator)	1500	3100	740
Benzothiazyl disulfide	1250	3200	820
2 Mercapto Thiazoline	1425	3300	730
Thiocarbanilide	1450	3150	680
2 Mercapto Benzimidazole	1700	3200	730
2 Mercapto Imidazoline	2100	3425	510

TABLE II

	Minutes Cured at 153° C.				
Neoprene Type GN		100.0	100.0	100.0	100.0
Phenyl Alpha Naphthylamine		2.0	2.0	2.0	2.0
Stearic Acid		0.5	0.5	0.5	0.5
Extra Light Calcined Magnesia		4.0	4.0	4.0	4.0
SRF Carbon Black		29.0	29.0	29.0	29.0
Zinc Oxide		5.0	5.0	5.0	5.0
2 Mercapto Imidazoline		—	0.25	0.5	1.0
Mooney Scorch, minutes		35	32	27	20
Stress at 300%, psi	5	875	1250	1350	1450
	10	1250	1450	1625	1825
	20	1425	1650	1825	2075
	40	1575	1775	2025	2250
Tensile Strength, psi	5	2325	3100	3250	3325
	10	3200	3225	3350	3350
	20	3225	3425	3450	3275
	40	3300	3400	3275	3350
Elongation, %	5	830	820	780	730
	10	760	740	700	560
	20	700	660	570	470
	40	630	600	500	460
Hardness, Shore A	5	52	57	57	58
	10	54	58	58	59
	20	57	58	58	61
	40	60	59	60	61

Note: This paper was delivered by the author before the Rubber Division, Chemical Institute of Canada, Toronto, Canada, June 21, 1950.

* The author is indebted to Dr. A. A. Baum for the original tests on these two compounds.

† Throughout this investigation, technical products were used wherever possible, as follows: Benzothiazyl disulfide—Accelerator MBTS; 2 Mercapto thiazoline—Accelerator 2-MT; 2 Mercapto imidazoline—Accelerator NA-22; Tetra methyl thiuram monosulfide—Thionex; Phenyl alpha naphthylamine—Neozone A; Salicylic acid—Retarder W.

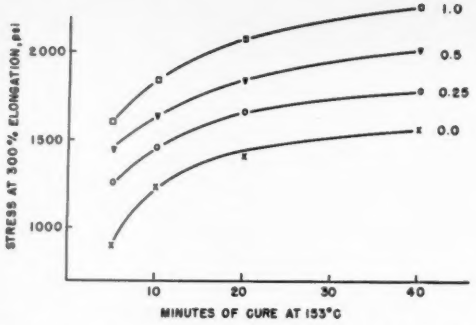

FIG. 1—Vulcanization of Neoprene Type GN with 2 mercapto imidazoline.

in Figure 1. It should be pointed out that throughout this paper the tendency to scorch of the compounds was measured by means of the Mooney shearing disc viscometer operating at a temperature of 121.1°C., using the small rotor. The time to scorch was selected as the time for the Mooney viscosity to increase 10 units from the minimum value.

These experiments show that as little as 0.25 part of 2 mercapto imidazoline per 100 parts of neoprene produces a marked acceleration as judged by both the rate and state of cure. As would be expected, increasing the concentration of the accelerator markedly increases its activity. In all cases, the results of laboratory tests indicate that the stocks could be processed in normal factory operations without undue difficulty.

Experience has shown that with both neoprene and natural rubber vulcanization, the results are frequently greatly influenced by the presence of acidic materials. The effects of adding organic acids of varying strength on the vulcanization of Neoprene Type W in the presence of 2 mercapto imidazoline as an accelerator were studied. The acids studied and their relative strengths as indicated by their dissociation constants are given in Table III.

The tests were carried out in a "gum type" Neoprene Type W stock using 2 parts of the acid per 100 parts of neoprene. The results obtained are tabulated in Table IV and the effect of the various acids on the modulus is shown graphically in Figure 2.

The results indicate that the effects obtained cannot be predicted from a knowledge of the strength of the acids employed. In the amounts used, the weakest acid tested, abietic, has a mild activating effect, whereas stearic acid, which is also a very weak acid, is a definite retarder of vulcanization. Of the stronger acids tested, salicylic acid is an extremely powerful activator both at processing and vulcanizing temperatures. On the other hand, oxalic acid is the strongest retarder of vulcanization of any of the acids tested in this series.

TABLE III

	Dissociation Constant
Stearic Acid	1.7×10^{-5}
Abietic Acid *	$<6.6 \times 10^{-10}$
Salicylic Acid	1.06×10^{-3}
Oxalic Acid	3.8×10^{-2}

* We are indebted to the Hercules Powder Company, Wilmington, Delaware, for this approximation.

TABLE IV

	Minutes Cured at 141° C.					
Neoprene Type W		100	100	100	100	100
Extra Light Calcined Magnesia		4	4	4	4	4
Zinc Oxide		5	5	5	5	5
Stearic Acid		—	2	—	—	—
Abietic Acid		—	—	2	—	—
Salicylic Acid		—	—	—	2	—
Oxalic Acid		—	—	—	—	2
2 Mercapto Imidazoline		0.25	0.25	0.25	0.25	0.25
Mooney Scorch, minutes		24	28	20	12	30
Stress at 600%, psi.	20	600	525	700	1425	425
	40	800	625	850	1625	500
	80	1125	810	950	1650	700
Tensile Strength, psi.	20	2750	2825	3700	3950	2200
	40	3000	2600	3975	3675	2525
	80	2950	2600	3850	3575	2550
Elongation, %	20	950	1000	1010	910	990
	40	870	860	940	840	940
	80	780	810	920	800	860

In recent years, it has been clearly established that the properties of the resulting vulcanizates as well as the rate of cure are a function of the accelerator used and that any practical accelerator must produce vulcanizates with outstanding properties. The effect of acceleration with 2 mercapto imidazoline on the properties of Neoprene Type W vulcanizates was therefore investigated.

The first property studied was age resistance which was evaluated by means of the oxygen pressure test (ASTM D-572-42). The use of tetra methyl thiuram monosulfide as a suitable accelerator for Neoprene Type W was disclosed by Forman et al *(4)* and the first comparison was made between stocks accelerated with 2 mercapto imidazoline and that accelerator in the following formulations:

Neoprene Type W	100.0	100.0
Stearic Acid	0.5	0.5
SRF Carbon Black	29.0	29.0
Extra Light Calcined Magnesia	2.0	2.0
Zinc Oxide	5.0	5.0
Tetra Methyl Thiuram Monosulfide	0.5	—
2 Mercapto Imidazoline	—	0.5

Cure—20 minutes at 153° C.

The results obtained after aging these vulcanizates are summarized in Table V.

This test showed that the stock accelerated with 2 mercapto imidazoline had slightly greater resistance to deterioration than did that accelerated with tetra methyl

TABLE V

	Original Properties	Properties After Aging in Oxyxen at 300 psi. and 70° C. 1 Day	5 Days
Tetra Methyl Thiuram Monosulfide			
Stress at 300%, psi.	1250	980	Completely
Tensile Strength, psi.	3500	2125	Deteriorated
Elongation, %	600	530	in 3 Days
2 Mercapto Imidazoline			
Stress at 300%, psi.	1975	1575	810
Tensile Strength, psi.	3350	2450	810
Elongation, %	420	430	300

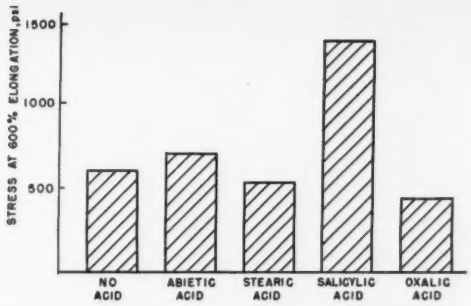

Fig. 2—Effect of various acids with 2 mercapto imidazoline.

thiuram monosulfide, although in both cases the resistance to deterioration is insufficient for practical applications. A similar test was therefore carried out in which one part of phenyl alpha naphthylamine was added to each stock as an antioxidant. In this test 44 parts of SRF carbon black were used in place of the 29 parts used previously and the stocks were cured for 20 minutes at 153° C. The results obtained on aging are summarized in Table VI.

This test confirms the previous test which showed that Neoprene Type W stocks accelerated with 2 mercapto imidazoline are somewhat more resistant to deterioration on aging than like stocks accelerated with tetra methyl thiuram monosulfide. It also demonstrates the remarkable resistance to oxidation of properly compounded neoprene vulcanizates. Even after the very severe test of eight weeks in the oxygen bomb, these stocks retained from 50 to 60 percent of their original tensile strengths.

Present day applications of elastomeric materials have emphasized the importance of the elastic efficiency of the vulcanizates as judged by the closely related properties of resilience and heat build-up. Experience has shown that although a high state of cure is required for pre-eminence in each of these properties, nevertheless the accelerator employed to produce the high state of cure has a marked effect on the results obtained.

A study was therefore made of the effect of 2 mercapto imidazoline on these properties in a Neoprene Type W vulcanizate. In order to more easily evaluate the effect of the accelerator on these properties, the following simple formulation was used rather than a formulation designed for practical applications in those fields requiring high elastic efficiency:

TABLE VI

	Original Properties	Properties After Aging in Oxygen at 300 psi. and 70° C. 56 Days
Tetra Methyl Thiuram Monosulfide		
Stress at 300%, psi.....	1975	1550
Tensile Strength, psi.....	3300	1650
Elongation, %	510	470
2 Mercapto Imidazoline		
Stress at 300%, psi.....	2900	2025
Tensile Strength, psi.....	3650	2150
Elongation, %	400	390

TABLE VII

	Minutes Cure at 153° C.	Amount of 2 Mercapto Imidazoline Used: 0	0.25	0.5	1
Stress at 300%, psi...	10	Undercured	950	1500	1975
	20	750	1125	1825	2175
	40	775	1125	1900	2450
Tensile Strength, psi..	10	Undercured	3450	3800	3475
	20	3100	3650	3875	3425
	40	3200	3500	3850	3450
Elongation, %	10	Undercured	700	500	500
	20	700	620	520	420
	40	700	600	520	400
Resilience, % ASTM D-945-48T ..	25	64	70	78	84
Heat Build-up, °C. ASTM D-623-41T, Method A	25	144	75	55	40

Neoprene Type W	100.0
Phenyl Alpha Naphthylamine	2.0
Stearic Acid	0.5
SRF Carbon Black	29.0
Extra Light Calcined Magnesia.....	2.0
Zinc Oxide	5.0
2 Mercapto Imidazoline .....variable	

The results obtained are summarized in Table VII.

The samples used for the measurement of both resilience and heat build-up were cured for 25 minutes at 153° C., since experience has shown that for this size sample such cure would be essentially equivalent to the 20-minute cure on the slabs used in the stress-strain determinations. The stress-strain data indicate that the 20-minute cure represents an optimum state of cure for these stocks.

It is readily apparent that the elastic efficiency of the stocks as judged by both resilience and heat build-up increases with increased accelerator content. The absolute value for resilience of the stock containing one part of 2 mercapto imidazoline compares favorably with that which can be obtained from a like stock produced from natural rubber. The heat build-up of the neoprene stock is, however, greater than that for the corresponding natural rubber stock.

A graphical representation of the relationship between resilience or heat build-up and stress at 300% elongation for the stocks tested is shown in Figure 3 and Figure 4. It will be noted that over the range of ac-

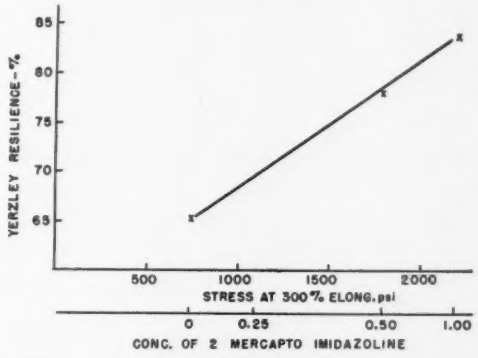

FIG. 3—Relationship between resilience and stress.

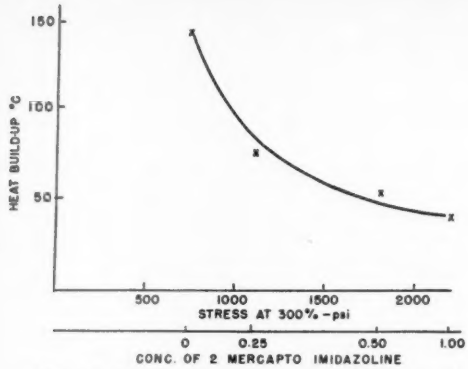

FIG. 4—Relationship between heat build-up and stress.

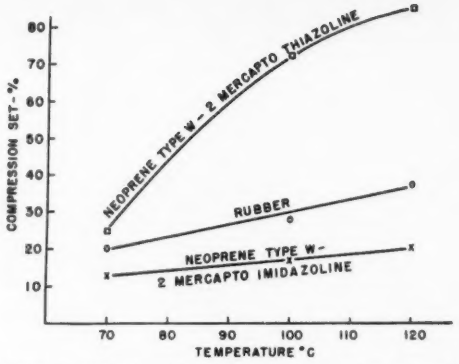

FIG. 5—Relationship between compression set and temperature.

celerator concentrations studied, the resilience is a linear function of the stress but that the heat build-up decreases to a greater extent as the accelerator content increases than would be expected from the corresponding stress values.

Another property of elastomeric products which has become increasingly important is their resistance to permanent deformation under conditions of compression. This property, usually called compression set, is a controlling factor in the successful application of elastomeric materials to such products as motor mountings. Like the properties of resilience and heat build-up, resistance to compression set requires a high state of cure but evidence is continually being produced which shows that a high state of cure alone is not a complete answer to the problem. Furthermore, the importance of the temperature at which the compression is imposed has only recently been appreciated.

A natural rubber stock of the type designed to have exceptionally good resistance to compression set and a Neoprene Type W stock accelerated with 2 mercapto thiazoline [this compound is a fairly powerful accelerator for Neoprene Type W *(4)* in contrast to its action in Neoprene Type GN] were included in the test as controls. The following formulations were used:

Neoprene Type W	100.0	100.0	—
Smoked Sheets	—	—	100.0
Phenyl Alpha Naphthylamine	2.0	2.0	2.0
Stearic Acid	0.5	0.5	1.0
Extra Light Calcined Magnesia	2.0	2.0	—
SRF Carbon Black	29.0	29.0	39.0
Zinc Oxide	5.0	5.0	5.0
2 Mercapto Thiazoline	1.0	—	—
2 Mercapto Imidazoline	—	1.0	—
Tetra Methyl Thiuram Monosulfide	—	—	2.0
Sulfur	1.0	—	0.5

TABLE VIII

Elastomer	Accelerator	Compression Set after 70 Hrs. at 70° C.	100° C.	121° C.
Neoprene Type W	2 Mercapto Thiazoline	25	72	85
Neoprene Type W	2 Mercapto Imidazoline	13	18	20
Natural Rubber	Tetra Methyl Thiuram Monosulfide	20	28	38

The results obtained on the compression set tests (ASTM D-395-47T, Method B) are summarized in Table VIII and Figure 5.

Not only has the use of 2 mercapto imidazoline as the accelerator produced neoprene vulcanizates which are far more resistant to compression set than its closely related analogue, 2 mercapto thiazoline, but these stocks are actually superior to the best "low set" natural rubber stocks. Even more striking is the small effect of temperature of test upon the resistance to compression set in neoprene stocks accelerated with 2 mercapto imidazoline. Previous experience had indicated that in general neoprene stocks, regardless of the type of neoprene used and the type of acceleration employed, always had a marked tendency to show a great loss in resistance to compression set as the temperature of testing was increased. In the case of the Neoprene Type W stock accelerated with 2 mercapto imidazoline, this temperature effect is almost completely eliminated; in fact it is far less than for the natural rubber stock which had always been considered to be pre-eminent in this respect.

Conclusion

Although the attempt to discover some relationship between molecular structure and accelerator activity by investigating a series of compounds related to mercapto benzothiazole was unsuccessful, it has lead to the discovery of a new and promising neoprene accelerator, 2 mercapto imidazoline. This compound is effective in various types of neoprene and produces vulcanizates which are characterized by good age resistance, high elastic efficiency, and remarkable resistance to permanent deformation under conditions of compression.

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Editorials. . .

Rubber Outlook

AS REPORTED ELSEWHERE in this issue, the price of natural rubber in the past several weeks has been representative of a run-away market, having reached 64½ cents for spot at one point, the highest price recorded in the last twenty-five years. As this is being written, however, natural rubber prices are returning to more realistic levels, dropping as much as 10 cents a day for nearby deliveries and the full 2 cents a day permitted by the Commodity Exchange on futures. While it is true that a commodity market always breaks faster than it advances, the chances are quite strong that the downward trend will continue until the price of natural rubber is a good deal closer to that of GR-S, barring any further unforeseen developments.

Analyses of the almost phenomenal rise in the price of natural rubber in the last sixty days have laid it at the door of the supply and demand situation, coupled with speculative manipulation in the primary markets occasioned by the Korean situation. Reports of continued reverses in Korea supplied additional fuel to such interests, despite the fact that Korea is thousands of miles away from the major rubber producing centers in the Far East. An idea of the harvest reaped by speculators can be secured from the following: A speculator who put up the required margin of $800 to purchase one contract of rubber on the Commodity Exchange early this year could have sold it for some $7,500 early this month, realizing a profit of about 940 percent. Margins on the Exchange have since been stepped up to $5,000 per contract.

In the considered opinion of many rubber market observers, however, the sensational price rise can be laid directly at the door of the rubber manufacturing industry, particularly the small and medium-size interests. Because of the fluctuating tendency of natural rubber prices, the industry has long been operating on almost a hand-to-mouth basis where its raw material supply is concerned. This is never a healthy situation, and becomes a most uneconomic situation whenever some development of a scare nature occurs, such as a tightening up of supply, a sudden jump in consumption, a political or military disturbance at or near supply centers, or a combination of such factors.

The net result of extremely low inventory positions on natural rubber is a sudden and immediate rush to guarantee shipments whenever any one of the above-mentioned factors comes into view. This is playing directly into the hands of the speculators who, based on previous experiences, know exactly how to handle the situation to their own best interests. The action of the rubber manufacturer at such times is closely akin to that of the layman who cleans out the grocery shelves of sugar, coffee and other products as soon as the whisper of shortage is heard. Aggravating the rubber situation still further at such times, is the demand of many customers to their suppliers of rubber end products to cover them on future deliveries by securing natural rubber for their account at any price. There has been a good deal of such purchasing in the past two months.

The supply and demand picture is always of foremost importance in the over-all view. The boom in consumption, highlighted by the tire and tube industry, continues at an accelerated pace, and can be expected to continue now that heavy military orders are in the offing. Production of passenger tires continued at a record pace in June, according to the Rubber Manufacturers Association, with 7,310,890 units rolling off the lines. In the first six months of the current year approximately 38,637,000 passenger tires were produced as compared with 33,111,000 in the corresponding period of 1949, an increase of well over 5,000,000 units. Despite the increase in world consumption of natural rubber, the statistics indicate that production is more than keeping step. Incidentally, shipments of natural rubber from Malaya during July amounted to 101,000 long tons, exceeding June shipments by more than 25,000 tons.

Major factors which will probably influence a downward trend in the price of natural rubber in the next few months, again barring unforeseen developments such as the Korean affair, include complete reactivation of all GR-S plants utilizing petroleum-butadiene, the possibility that the government may loan natural rubber to manufacturers on military orders, and the likelihood of the re-institution of government controls on end products. To clarify a point raised by many rubber manufacturers, the government does not have power to ration or control inventories of rubber consumer goods, but authority to institute controls covering allocation, inventories, consumption, etc., is contained in the active Rubber Order R-1.

That some governmental action will be taken within the next few weeks seems evident. A series of meetings has been held in Washington in recent weeks at which major topics were under consideration, including government controls and allocations, loan of rubber from government stockpiles on war orders, and increased stockpiling by the government and consumer purchases for inventory. The chances are quite likely that a decrease in the amount of natural rubber used in tires and other products will be ordered. With increasing supplies of synthetic rubber coming into bearing this should prove no hardship to the industry.

CURRENT NEWS OF THE MONTH

LATEST DIRECTIVE ON SYNTHETIC RUBBER RAISES ANNUAL OUTPUT TO 675,000 TONS

A DIRECTIVE to the Reconstruction Finance Corporation to increase synthetic rubber production by 100,000 long tons a year was issued by the White House on July 28. The directive was included among several powerful moves proposed by the Administration to advance the country's mobilization for the Korean war and to ward off other threats of international communism. The rubber directive followed by a few days a suggestion for practically complete reactivation of all synthetic plants made by the reorganized government advisory committee on rubber.

The latest order on reactivation follows that of July 7 when the RFC announced that facilities for the production of approximately 88,000 additional long tons of synthetic rubber, GR-S and butyl, would be reactivated, along with one butadiene plant with a capacity of 50,000 tons annually. Subsequently it was announced that the copolymer plant to be reactivated would be the one at Port Neches, Texas, the butyl plant at Baton Rouge, La., and the butadiene plant at Houston, Texas.

While neither the White House or the RFC announced the specific plants to be reactivated under the new order of July 28, it is understood that all remaining copolymers units will be reopened with the exception of the unit at Institute, West Va. The latter unit, a 90,000 ton-a-year facility, formerly operated by U. S. Rubber, is designed to operate on alcohol-butadiene, and for the present plans do not call for reactivating the government-owned alcohol-butadiene plants located at Louisville, Ky., and Kobuta, Penna.

Copolymer Facilities Involved

In addition to the copolymer facilities at Port Neches and Institute, there are only three others in stand-by condition. Two of these are located in Los Angeles, with a combined capacity of 75,000 long tons a year, both of which were formerly operated by the Goodyear Synthetic Rubber Corporation, while the third is located at Louisville, Ky. The latter unit has a 30,000 ton capacity and was formerly operated by the National Synthetic Rubber Corporation, at one time a joint corporation owned by several small tire manufacturers but now a wholly-owned subsidiary of the Minnesota Mining & Manufacturing Co.

According to reports, the Los Angeles facilities will probably be turned over to Minnesota Mining for reactivation and operation, while the Louisville unit may be given to another joint ownership group. The objective in the latter instance would be to give a number of smaller rubber manufacturers the "feel" of synthetic rubber production and meet some of the monopoly criticism raised by the Senate's Small Business Committee.

The net effect of the directive of July 28 will be to raise the output of synthetic rubber to an annual rate of approximately 675,000 long tons a year, of which some 600,000 tons will be GR-S and 75,000 tons butyl rubber. To meet this schedule it will be necessary to reactivate all of the petroleum-butadiene units, including the 25,000 ton plant at Torrance, Calif., formerly operated by the Shell Chemical Corp., the 18,000 ton plant at El Segundo, Calif., formerly operated by the Standard Oil Co. of California, and the 15,000 ton plant at Baton Rouge, La., formerly operated by the Esso Standard Oil Co. All of these plants are in standby condition.

Top executives of the rubber manufacturing industry hailed the latest reactivation order. In expressing satisfaction with the order, John L. Collyer, president of the B. F. Goodrich Co., said that "our ability to make sufficient rubber for our needs in war or peace may well prove to be the most economical program the American people have ever underwritten." Stating that the people of this country need have no fear concerning our eventual rubber supply if we take full advantage of our synthetic rubber-producing capacity, Harvey S. Firestone, Jr., chairman of the Firestone Tire & Rubber Co., re-emphasized his previous statement that the synthetic rubber plants "are the best paid-up insurance policy America has ever had."

An urgent plea for complete reactivation of all synthetic rubber plants was made before the House of Representatives by Representative Curtis (Rep., Nebraska) on July 11. He termed his proposal "a realistic long range plan for our own defense" and not any "war hysteria move." Without referring to the RFC decision of July 7 to reactivate one GR-S and one butyl rubber unit, Mr. Curtis accused the Administration of "botching" the postwar synthetic rubber program with a "hostile policy."

Initial Operators Named

On July 13 the RFC announced that the U. S. Rubber Co. will reactivate and operate the 75,000 ton GR-S plant at Port Neches, Texas. U. S. Rubber is currently operating a government-owned synthetic plant at Naugatuck, Conn., with a capacity of 30,000 tons, and a plant at Borger, Texas, with a capacity of 45,000 tons. It will continue to operate the Borger plant until Port Neches is completely reactivated, after which operation of Borger will be turned over to the Phillips Chemical Co. All supervisory personnel at Borger will be transferred to Port Neches and additional personnel will be hired from the Port Neches area. The plant will employ about 450 workers.

According to Gerald B. Hadlock, director of RFC's Office of Rubber Reserve, U. S. Rubber and Phillips Chemical will work together and then make a simultaneous switch of the two plants. Mr. Hadlock stated that both Goodrich and Firestone had asked to run the Port Neches plant, but their applications were denied because giving it to either would have been contrary to the stand taken by the Department of Justice on monopolistic practices in the synthetic rubber field. In testimony at several hearings on the synthetic rubber program, Phillips' officials had asked for the right to get into synthetic production for the government, charging that existing regulations excluded firms like Phillips in favor of the large rubber companies.

The Port Neches plant was originally constructed by Goodrich which has since operated half of it. The other half was operated by Firestone until it was put into standby condition some four years ago. It is this latter half which is being reactivated by U. S. Rubber.

According to K. S. Adams, president of the Phillips Petroleum Co., transfer of operations at Borger to Phillips will mark the first integrated manufacture of synthetic rubber through all stages from the production of raw materials to the finished product. Phillips Chemical now operates the adjoining Plains butadiene plant, which it designed and built for the government during the war. The Plains plant produces more than 50,000 tons of butadiene annually. Substantial savings to the government are expected through operation of the copolymer plant and the adjoining butadiene plant as a combined unit.

In connection with the initial reactivation order of July 7, it was also an-

nounced that the 13,000 ton butyl rubber plant at Baton Rouge, La., now in standby condition, will be reactivated and operated by the Esso Standard Oil Co., and that the butadiene unit at Houston, Texas, will be similarly handled by Sinclair Rubber, Inc. The latter company is a wholly-owned subsidiary of the Sinclair Oil Co., organized during the war to build and operate the Houston unit.

Status of Styrene Supply

In announcing initial plans for the reactivation of the copolymer plants, Mr. Hadlock stated that no shortage is expected in styrene supplies. The "voluntary priority system" suggested by Lyndon Johnson (Dem., Texas), chairman of the Senate Armed Services Committee, as well as that committee's subcommittee on rubber, is not necessary at present, Mr. Hadlock said.

The government can get all the styrene it needs in the open market, declared Mr. Hadlock. The increase in benzol prices has knocked some competitors out of the market and will make more styrene available for synthetic rubber, he said. Senator Johnson suggested that Mr. Hadlock ask other benzol users to grant the Government a priority in order to increase synthetic output. He volunteered to introduce legislation assuring continued rubber production if voluntary measures fail.

According to a recent survey conducted by the Society of the Plastics Industry, there is an estimated capacity in all United States styrene plants of approximately 510,000,000 pounds. The production of GR-S in 1949 accounted for 163,000,000 pounds. The 1949 production of styrene required over 45,000,000 gallons of benzene, or about one-third of the total coke oven supply amounting to around 141,000,000 pounds. Recent estimates by the American Coal and Coke Chemicals Institute show styrene taking approximately 30% of all available benzene supplies.

Because of current shortages and increasing requirements for benzene, as well as phenol, the U. S. Bureau of Mines has undertaken an investigation of these and other chemicals available in producing synthetic liquid fuels from coal and oil shale. The major objective of the study is to determine the most desirable processes for producing chemicals in conjunction with synthetic fuels. Until recently, benzene was available only as a co-product in the manufacture of oven coke. For the first time, benzene is now being produced from petroleum at a plant in Texas City, Texas.

Thiokol Stock on Exchange

Stock of the Thiokol Corporation, of Trenton, N. J., was recently admitted to listing on the New York Curb Exchange. Approval for application of such listing was granted by the company's stockholders. For the first four months of the current year the company earned $43,840, or 14 cents a share on 306,000 capital shares outstanding. If profits continue at this rate, the company will net about 42 cents a share for the year, as compared with a profit of $73,234, or 24 cents a share, in 1949. The company has never paid a dividend.

Small Business and the ECA

The Office of Small Business of the Economic Cooperation Administration, Washington, D. C., has released a study indicating the share of Marshall Plan business received by small manufacturing firms in the United States during a selected 4-month period, April-May and November-December, 1949. The study shows that manufacturing firms employing less than 500 persons received $44,000,000 in direct ECA payments, or 20% of all ECA payments to manufacturers within the period covered. Of the $823,000,000 in ECA payments which went to American suppliers, 71% went to non-manufacturing concerns, 27% to manufacturers, and 3% to unclassified companies.

Oil Firm Tire Monopoly Cited

A complaint charging five Standard Oil companies and the Atlas Supply Co. of Newark, N. J., with monopolistic practices in the purchase and resale of tires, batteries and other automobile accessories, was issued on July 25 by the Federal Trade Commission in Washington, D. C. The oil companies named include the Standard Oil Companies of New Jersey, Ohio, Calif., Kentucky and Indiana. According to the complaint, the Atlas company was organized in 1929 to act as a purchasing agent for the Standard Oil companies who sell the purchases under the trade name "TBA" products. The complaint charges that all Atlas common stock is owned in equal amounts of 100,000 shares each by the cited oil companies or their wholly-owned subsidiaries. Allegedly anti-trust practices named in the complaint include: Direction of attention of sellers to the purchasing power possessed by the oil companies in order to obtain discriminatory prices, discounts, allowances and rebates; replacing sellers who would not accede to such demands with sellers who did; entering into contracts whereby sellers agreed not to sell to Standard-Atlas competitors at prices lower than those charged Standard-Atlas; passing on to the Standard companies, in the form of dividends on Atlas common stock, rebates on purchases made through Atlas. The first hearing is scheduled in New York City on October 16.

Plans Nebraska Plant Addition

Goodyear Tire & Rubber Co. has announced plans for the construction of a $1,000,000 addition to its plant at Lincoln, Neb. Construction is scheduled to begin within the next few months and when completed will result in a 50% increase in productive capacity. The factory, which now employs between 500 and 600 workers making 45,000 belts daily for motors and farm machinery, will add 200 or more employees upon completion of construction.

INDUSTRY'S ADVISORY COMMITTEE IS AGAIN FUNCTIONING ACTIVELY

The Rubber Industry Advisory Committee, which includes many of the industry's top executives and which played a strategic role in the last war, has resumed functioning as an active group. The committee held its first meeting in over three years on July 25 at the Pentagon in Washington, D. C. Reportedly, the meeting was held at the request of the Munitions Board and was attended by a number of military advisers. P. W. Litchfield, board chairman of the Goodyear Tire & Rubber Co., was elected chairman of the committee. The last chairman on record was Charles H. Baker of the Goodyear Footwear Corp.

Although no official statement was issued as to the purpose of the meeting of the reactivated committee, it is believed that the talk centered on recent efforts of the government to stockpile rubber and on the general tire situation. According to a spokesman for the Munitions Board, all phases of both topics were extensively discussed but the specific discussion has been rated as "classified" by the military services for reasons of national security.

Recommends Reactivation

The committee took only one positive step, according to reports from Washington, namely in the recommending of immediate reactivation of the three standby petroleum-butadiene plants. No discussion was held on the alcohol-butadiene plants. It was intimated that subsequent meetings of the committee will be held as mobilization increases for the Korean campaign. The committee is composed of twenty-nine executives from the rubber and allied industries, including the following:

P. W. Litchfield (Goodyear), John L. Collyer (Goodrich), Harvey S. Firestone, Jr. (Firestone), Herbert I. Smith (U. S. Rubber), William F. O'Neil (General Tire), J. P. Seiberling (Seiberling), F. D. Hendrickson (American Hard Rubber), F. Thatcher Lane (Seamless Rubber), Everett Morss (Simplex Wire), James A. Walsh (Armstrong Rubber), Charles W. Yelm (Gates Rubber), Harry E. Smith (Manhattan Rubber), Oliver G. Vinnedge (Dryden Rubber), H. A. Paterson (Astlett), M. J. Rathbone (Standard Oil).

Also, G. L. Scheinler (Robert Badenhop), R. G. Landers (Landers Corp.), T. M. Martin (Lion Oil), Jean H. Nesbit (U. S. Rubber Reclaiming), Alan Grant (Charles T. Wilson), W. H. Hoffman (Neches Butane Products), Harold W. Holcombe (Baird Rubber), George A. Davidson (Standard Oil, California), Jacobus F. Frank, A. L. Freedlander (Dayton Rubber), Ray Boundy (Dow Chemical), Thomas Robins, Jr. (Hewitt-Robins), E. R. Bridgwater (DuPont Rubber Chemicals), and Paul Terretta (O'Sullivan Rubber).

Nearly two billion dollars will be spent on state highway improvements and maintenance during 1950, according to the American Petroleum Industries Committee. New road construction will be 15% above the 1949 level.

JUNE RUBBER CONSUMPTION SETS MONTHLY HIGH OF 110,792 TONS

Estimated consumption of new rubber during June, 1950, reached a new monthly record of 110,792 long tons, according to the Rubber Manufacturers Association. The June total compares with 110,010 long tons used in May, 1950, which was itself a record total. Use of natural rubber in June amounted to 62,546 long tons, against the 63,641 tons of natural consumed in the previous month. Consumption of synthetic rubbers in June rose to 48,246 long tons from the 46,369 tons consumed in the previous month. Reclaimed rubber consumption during June was estimated at 24,474 long tons, against 24,305 long tons consumed in May.

A breakdown of the synthetic rubber consumed in June indicates that 36,874 tons of GR-S were consumed, against the 35,445 tons used in the preceding month. Neoprene used in June totaled 3,671 tons, compared with 3,597 in May. Butyl consumption amounted to 6,081 long tons, contrasted with the 5,812 long tons consumed in the previous month. A total of 1,620 long tons of N-types were consumed during June, against 1,515 long tons in May.

Commerce Department Reports

In previous reports issued by the Department of Commerce, it was stated that figures for May, 1950, indicated a continuing shift from high-priced natural to synthetic rubbers. Consumption of GR-S reached 33,541 tons in May.

Tremendous tire production pushed May new rubber consumption in the transportation field to 74,999 tons, only 1,971 short of the January, 1947, record. In April, 1950, new rubber consumption was 64,619 tons, and in May, 1949, 57,099 tons. Although consumption of natural rubber in this segment reached a postwar high of 44,107 tons in May, its use declined proportionally. Consumption of GR-S soared to 24,931 tons, the highest in 29 months, and its ratio to total natural plus GR-S consumption increased to 36.0 percent from 33.8 percent in April. The postwar low of 28.3 percent was reached in February of this year. The ratio of reclaim consumption to total new rubber consumption in the segment declined from 17.3 percent in April to 16.3 percent in May.

In the non-transport segment, May new rubber consumption established a new high of 35,212 tons, up 1,013 tons from the previous record of 34,199 tons set in March of this year. In April, 1950, the figure was 31,370 tons, and in May, 1949, 24,395 tons. Natural latex consumption in this segment set another new record of 4,200 tons, 58 tons higher than the March, 1950, figure. The GR-S ratio rose sharply to 30.7 percent in May from 27.3 percent in April, and the reclaim ratio increased to 33.9 percent from 32.4 percent. The non-transport segment accounted for 31.9 percent of total U. S. new rubber consumption in May, compared with 32.7 percent in April, and 29.9 percent in May, 1949.

Proportionate use of reclaim, however, declined in May in the transportation segment, and increased in the non-transport segment. For both segments combined, new rubber consumption reached a new high of 110,211 long tons, replacing the old mark of 104,092 tons established in January, 1947. New rubber consumption in the non-transport field totaled 163,784 tons in the first five months of 1950, up 22.5 percent from the 133,720 tons posted in January-May, 1949. In the first five months of 1950, new rubber consumption in the transportation field totaled 323,320 tons, up 10.7 percent from the 292,085 tons reported in the corresponding period of 1949.

New Estimate on Consumption

The Natural Rubber Bureau, of Washington, D. C., predicted on July 17 that the United States will use 1,150,000 long tons of rubber this year, or approximately 175,000 tons more than in 1949. Of the 1950 total, the Bureau estimated that 670,000 long tons would be natural rubber and 480,000 tons synthetic rubber. In 1949, the consumption of natural rubber totaled 570,000 long tons while synthetic rubber totaled 405,000 tons.

First Quarter Labor Record

The Bureau of Labor Statistics of the U. S. Department of Labor has announced that in the first quarter of 1950 there were 16 work stoppages in all branches of the rubber industry. Some 27,500 employees were involved incurring a loss of 89,400 days of work. The study counted a work stoppage as any labor management trouble involving six or more employees and lasting longer than one shift. The Department reported lost days of employment as the number idle both as a direct and indirect result of the stoppage. All industry reported 15,100,000 days of idleness in the first quarter of 1950. At the peak period in the quarter, the number out was 718,000 in 770 different work stoppages. Wages and related issues such as pensions caused the trouble in the quarter.

Huber Plans Carbon Black Unit

J. M. Huber Corp., New York 17, N. Y., has announced plans for the construction of a new furnace carbon black plant near Baytown, Texas. It is expected that the plant will be completed by March 31, 1951, and will cost $1,500,000. Its annual capacity will be 30,000,000 pounds of HAF type carbon black, the raw material for which is oil. The company's present carbon black operations are at Borger, Texas, where it operates what is said to be the largest channel black plant in the world. The Borger unit also produces furnace black. It was also announced that the company will spend approximately $6,000,000 this year for new plants and new gas and oil wells. Sales for 1950, based on operations for the first six months, average 20% more than in 1949, company officials announced, in offering reasons for the expansion program.

SET RUBBER SECTION PROGRAM FOR NATIONAL SAFETY CONGRESS

The Rubber Section of the National Safety Council has announced its complete program for the meeting to be held in Chicago, Ill., during the week of October 16 in conjunction with the parent society. The Section will hold its meeting on October 18 and 19.

The meeting will be opened by H. L. Andrews (Firestone, Pottstown), general chairman of the section, who will render a report on sectional activities. Outstanding facts on the 1949 Rubber Section Safety Contest will be given by J. J. Raytkwich (Naugatuck Chemical) and remarks by contest winners will be given by F. C. Thayer (U. S. Rubber, Mishawaka) for large plants and by John S. P. Wilson, Jr. (Goodrich, Miami) for small plants.

A round-table on "Current Government Measures Affecting Safety in the Rubber Industry" will be held, with specific remarks by J. T. Kidney (Goodyear, Akron), Glen D. Cross (Firestone, Akron), and W. E. McCormick (Goodrich, Akron).

Two papers will feature the session to be held on October 19. These are "A New Look in Industrial Safety," by George Harper of the University of Illinois, Urbana, Ill., and "Medical Aspects of Accident Prevention" by R. R. Meigs of the Liberty Mutual Insurance Co., Boston, Mass. Election of officers for the 1950-51 term will be held during this session.

New Plasticizer Plant Open

Commercial production of a new line of synthetic organic chemicals, consisting of a variety of plasticizers used in the compounding of resins, rubber, and paint, is now under way at the recently completed Plasticizer Division plant of Pittsburgh Coke & Chemical Co., Pittsburgh 19, Penna. The new facilities at Neville Island, adjacent to the company's phthalic anhydride and tar acid refining operations, manufacture several phthalate and phosphate type plasticizers, a number of esters of adipic and sebacic acid, and various specialties including polymeric type plasticizers. The new plant is producing plasticizers that are essentially odor-free, water-white, acid-free and of constant physical and chemical properties. A new fully equipped laboratory has been set up to handle plasticizer sales service problems, as well as to permit the thorough evaluation and testing of new plasticizers developed by the research department.

Predicts Higher Footwear Prices

Rising natural rubber prices and other increased manufacturing costs indicate the need of higher wholesale prices for waterproof footwear, Raymond H. Blanchard, president of the Hood Rubber Co., Watertown, Mass., said recently. As soon as the advance season's orders are filled, Mr. Blanchard said, his company, a division of B. F. Goodrich, will consider a boost in wholesale prices to offset these higher production costs.

FURTHER DATA ON NEW SAF BLACK FURNISHED BY PHILLIPS CHEMICAL

Some further data on the new furnace carbon black developed by the research laboratories of the Phillips Petroleum Co. has been made available by the Phillips Chemical Co., which handles its sales. As previously reported, the new black, which has been designated as SAF black, is produced from oil by a continuous process in semi-commercial pilot plant equipment of unique design suitable for large-scale commercial plant operations.

Commercial carbon blacks range from the so-called soft black of large particle size to the HAF (high abrasion furnace) black of smaller particle size. The new Phillips SAF black, according to the company, extends this range still further in the direction of even smaller particle size. The particle diameter of the SAF black under the electron microscope is about three-fourths that of Philblack O, the pioneer HAF black. Some of the other physical and chemical properties of the SAF black, as compared to Philblack O, are as follows:

	SAF Black	Philblack O
Surface Area by N_2 Adsorption, square meters/gram	143	80
pH	9.4	9.5
Volatile Matter, per cent	2.1	1.14
Ash, per cent	0.195	0.156
Moisture, per cent	1.78	1.02
Benzene Extractable, per cent	0.17	0.07
Iodine Adsorption, mg/gm	145.9	88.5
Oil Adsorption, cc/gm	1.7	1.16

Electrical properties of the new black appear extremely interesting, on the basis of preliminary test data. 41° F cold rubber compounds loaded with 50 parts of SAF black had resistivities approximately the same as similar compounds loaded with 50 parts of acetylene black.

Laboratory Evaluation Tests

In laboratory rubber evaluation tests, the SAF black has shown abrasion resistance 25 to 30 per cent higher than Philblack O in GR-S tread stocks and 40 to 50 per cent higher than Philblack O in 41° F cold rubber compounds. Other properties imparted by SAF black to a GR-S tread compound in comparison with Philblack O include slightly higher modulus and tensile strength with equal elongation. Shore hardness is somewhat higher than equivalent Philblack O stocks at equal loadings and equal softener levels. Heat build-up with the new black is slightly higher than with Philblack O, while other properties are substantially equal. Stocks compounded with SAF black are somewhat stiffer than equivalent Philblack O stocks, as would be expected, however, this can be compensated for by additional softener with very little sacrifice in the superior abrasion resistance achieved by the new black.

Further compounding studies are expected to develop other means of obtaining easily processable stocks with the new black. It is quite possible that this black, if and when produced on a commercial scale, will be most advantageously used by coprecipitation with rubber latex and with polybutadiene latex to form a rubber-black masterbatch.

Samples of SAF black have been distributed to leading tire manufacturers for laboratory evaluation and for processing into passenger and heavy duty tires for actual road tests. For the road test program, the black will be compounded into treads of 41° F cold rubber, natural rubber, and the new 86° F polybutadiene rubber recently developed by Phillips in cooperation with Rubber Reserve.

The cost per pound of the SAF black will be somewhat higher than that of the HAF blacks now on the market; however, it is anticipated that cost per mile of tire life will be lower. The unique properties of the new black could be utilized in several ways, according to Phillips, such as production of tires equal to today's best quality with appreciably thinner treads, thus conserving rubber and black and contributing to lower running temperatures; by use in tread compounds having a considerable portion of the rubber replaced by reclaimed rubber or other extruder yet achieving quality equal to today's standard; by blending with other blacks to produce good quality treads at low cost, and as a replacement for acetylene or conductive channel blacks.

Final plans for full commercial production of the SAF black will be determined after the tire road tests now being initiated are completed. More detailed information on compounding and on properties of uncured stocks and vulcanizates is available from the company.

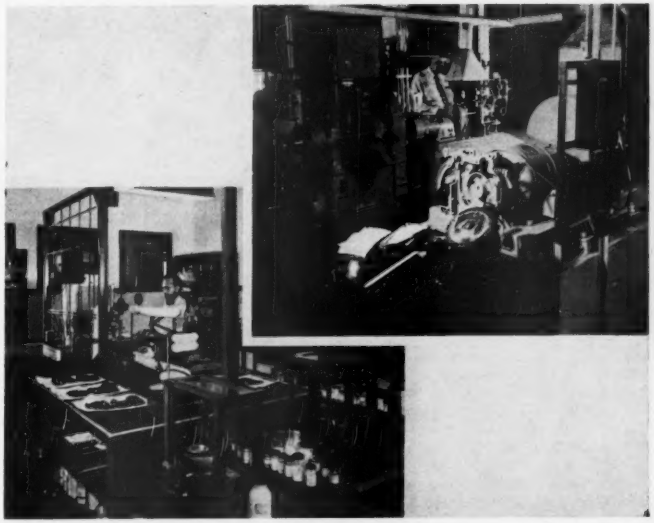
Surplus Alcohol Plant Sold

The surplus Government alcohol plant at Omaha, Neb., has been sold to the Central-States Corp. of Chicago, Ill., and will be used for the production of 22,000,000 gallons of industrial alcohol annually. The General Services Administration said the plant was sold for $1,750,000. The national security clause was part of the transaction so the plant can be taken back in the event of an emergency. The new owners, the Government said, will produce alcohol at the plant's rated capacity. The plant originally cost the Government $6,278,000, and was formerly operated by the Farm Crops Processing Corp. Sales terms were 20% cash and mortgages for the remainder, payable in equal quarterly installments for 15 years with interest at 4%.

Vansul Vinyl Plastics Colors

Vansul & Co., Englewood, N. J., has initiated an intensive development program for the production of color dispersions and master batches for the vinyl plastics field. The company expects to produce forms of dispersed colors along the same lines as the Vansul Master Batches produced for the rubber trade for the past twenty-five years. Herbert H. Watjen, formerly associated with Sinclair & Valentine Co., New York 25, N. Y., has been named technical director to head this program.

RUBBER EQUIPMENT AT AMERICAN CYANAMID'S RESEARCH LABORATORIES



The Stamford Research Laboratories of the American Cyanamid Co. at Stamford, Conn., were first established in 1936. They have grown steadily in size until today the laboratory buildings are spread over an area of more than 40 acres, floor space alone consisting of some 410,000 square feet, or more than 9.6 acres. Approximately 800 people are employed, about half of whom have technical degrees. Testing of the various rubber chemicals and compounding ingredients manufactured by American Cyanamid is one of the many functions of the laboratories. The rubber mill room is shown in one of the above views (upper) while a view of the rubber chemicals laboratory is seen in the other (lower). The first "open house" since the laboratories were initially organized was recently held.

STATISTICAL RUBBER POSITION CITED IN LITCHFIELD REVIEW

In a review of the current rubber situation released recently, P. W. Litchfield, chairman of the board of The Goodyear Tire & Rubber Company, declared that the nation's supply of raw natural rubber is too low from the standpoint of national security and the price is too high for economic stability. Mr. Litchfield warned that statistically the rubber picture in this country is worse than was the case just prior to Pearl Harbor.

As an effective remedy the Litchfield review urged that the government proceed at once to step up production of synthetic rubber to 50,000 long tons per month, and that it start the creation of a stockpile of 200,000 tons for possible national emergencies. The nation's state of unpreparedness in the matter of rubber supply is in strange contradiction to other vast moves being made by the government to protect our national security, he said.

The Litchfield rubber review which did not anticipate the current Korean situation, warned against further dispersal of government-owned synthetic rubber plants and responsibilities for their operation. He pointed out that disposal of three styrene producing plants, originally components of synthetic rubber producing facilities, had aggravated the present situation in the rubber supply. "The American synthetic rubber industry," Mr. Litchfield said, "is above all, a weapon of national defense. Our economy and our national security primarily depend upon mobility, and mobility, in turn, depends upon rubber."

In reviewing the developments of the past year, Mr. Litchfield said the price of natural rubber had jumped from 16 cents to 35 cents, while GR-S remained pegged at 18½ cents. He pointed out that every increase of one cent per pound in natural rubber means an additional $15 million per year out of the pockets of American rubber consumers. The demand for rubber has far exceeded earlier forecasts due to the continuing boom in the automotive industry, and too, the resumption of buying of natural rubber by the government for stockpiling purposes has tended to boost prices. At the same time, our reserves of synthetic rubber were permitted to dwindle, feed stocks were and continue to be precariously short and thus, synthetic no longer exerts a restraining influence on the competitive price of natural rubber.

Serious political instability in Indonesia and threats of Communism in Malaya and Indo-China are factors underlying the market, too, since 90 per cent of the natural rubber supply comes from those countries, he said. "Such excessive prices and instability in the rubber market as now prevail," Mr. Litchfield continued, "are not economically healthy in the long run." He said, too, that there has been an increase in the flow of American dollars to the dollar-short countries from which we import rubber, and perhaps this has been viewed with sympathetic indulgence in certain government circles.

Soaring prices and acute shortages of both dry and liquid rubber will tend to stifle prospects for larger use of foamed rubber products, for rubber paving material and in other potential fields, he said. Rubber growers and governments in rubber-growing countries are fully aware of these dangers and prefer to avoid them in the interest of future economic expansion and stability; the growers would be entirely happy with a price of 22 cents or thereabouts.

Coming Events

Sept. 3-8. A.C.S., 118th National Meeting, Chicago, Ill.

Sept. 14. Southern Ohio Rubber Group, Engineers Club, Dayton.

Sept. 19. A.S.M.E. Rubber & Plastics Div., Fall Meeting, Hotel Sheraton, Worcester, Mass.

Sept. 29. Northern Calif. Rubber Group, Claremont Hotel, Berkeley, Calif.

Oct. 6. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit.

Oct. 11-13. Rubber Division, A.C.S., International Rubber Meeting, Hotel Cleveland, Cleveland.

Oct. 16-20. Technical Committee 45 on Rubber, International Organization for Standardization, Hotel Mayflower, Akron, Ohio.

Oct 16-20. National Safety Congress and Exposition, Chicago.

Oct. 17. Buffalo Rubber Group, Hotel Westbrook, Buffalo, N. Y.

Oct. 18-20. Society of the Plastics Industry, Annual Conference, Swampscott, Mass.

Oct. 20. N. Y. Rubber Group, Henry Hudson Hotel, New York.

Oct. 20. Boston Rubber Group, Somerset Hotel, Boston.

Oct. 24. Washington Rubber Group, Annual Dinner, Hotel Washington, Washington, D. C.

Nov. 10. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Nov. 26-Dec. 1. A.S.M.E., Annual Meeting, New York, N. Y.

Dec. 8. Detroit Rubber & Plastics Group, Xmas Party, Detroit-Leland Hotel, Detroit.

Dec. 11. Northern Calif. Rubber Group, Xmas Party, The Willows, Orinda, Calif.

Dec. 15. N. Y. Rubber Group, Xmas Party, Henry Hudson Hotel, New York.

Dec. 15. Boston Rubber Group, Xmas Party, Somerset Hotel, Boston.

Dec. 19. Buffalo Rubber Group, Xmas Party, Elks Club, Buffalo, N. Y.

Jan. 26, 1951. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Feb. 28-Mar. 1-2, 1951. Rubber Division, A.C.S., Spring Meeting, Washington, D.C.

ASME RUBBER-PLASTICS GROUP TO MEET IN WORCESTER, MASS.

The next meeting of the Rubber and Plastics Division of the American Society of Mechanical Engineers will be held on Tuesday, September 19, at the Hotel Sheraton in Worcester, Mass. The meeting will be held in conjunction with the Fall Meeting of the parent society, which will be held from September 19 to 21, inclusive.

Three technical papers will be presented at the morning session of the divisional meeting, starting at 9:30 A.M. These are: "Dynamic Shear Properties of Rubber-like Polymers," by I. L. Hopkins, Bell Telephone Laboratories, New York; "Comparative Strengths of Some Adhesive-Adherent Systems," by N. J. De Lollis, Nancy Rucker, and J. E. Wier, National Bureau of Standards, Washington, D. C., and "Rubber-Phenolic Molding Materials," by Wyman Goss, General Electric Co., Pittsfield, Mass.

The division will hold a joint session in the afternoon with the Textile Division of the society. Two papers will be featured at this joint session, as follows: "Plastics in the Textile Industry," by F. P. Hunsicker, Westinghouse Electric Corp., Boston, Mass., and "Industrial Applications for Nylon Plastics," by J. E. Teagarden, E. I. du Pont de Nemours & Co., Wilmington, Del. A dinner meeting of the Advisory, Executive and General Committees of the Rubber and Plastics Division will be held in the evening of September 19.

Polyethylene Wrap for Butyl

A decision to wrap bales of butyl rubber in polyethylene prior to insertion in cartons has been reached by the Office of Rubber Reserve. At present, butyl is packed after soapstone dusting in a coated box with coated liners. This method of packaging presented two specific problems, namely, despite the precautions taken there was adhesion of the rubber to the box, and cold flow often caused the boxes to burst. Adoption of the polyethylene lining is expected to eliminate both of these problems. A major feature of the polyethylene lining is the fact that it does not have to be stripped from the butyl prior to use, but can be compounded with the rubber.

Dow Latex Plants in Production

The completion of two latex production plants has been announced by the Dow Chemical Co., Midland, Mich. A new plant at Freeport, Texas, and the rebuilt plant at Midland have started production. The plants will provide expanded production for latex coatings materials which have gained wide acceptance in the paper, textile and paint industries. The Midland latex plant was severely damaged by fire some months ago and has been completely rebuilt and enlarged. With the addition of the new Texas plant, Dow's latex production capacity has been doubled, company officials said.

DEDICATORY EXERCISES MARK FIRESTONE 50TH ANNIVERSARY

Dedication of a beautiful and impressive memorial to Harvey S. Firestone in Akron, Ohio, highlighted the celebration of the Fiftieth Anniversary of the founding of the Firestone Tire & Rubber Co. The ceremonies took place on August 3, upon which day the company was founded by Mr. Firestone fifty years before. Harvey S. Firestone, Jr., chairman of the company, was assisted in the unveiling by his four brothers, Russell A., Leonard K., Raymond C., and Roger S., all active in the management of the company.

A comprehensive exposition of Firestone's half century of research, technical and production progress was opened to employees and the public in the Firestone Research Building as part of the anniversary celebration. The exposition dramatically portrays the progress made by the company from its original inception as a local enterprise to its present position. Growth of the company from a small abandoned foundry building with a working force of 12 to a world-wide organization of more than 70,000 people is shown through numerous product and historical displays.

Featured in the exhibit is a collection of products first made possible by Firestone. These include the first mechanically-fastened straight-side tire which was the forerunner of the type now in universal use; the first commercial demountable rim which has now become the demountable wheel; the first rubber non-skid tread which is now a safety feature of all pneumatic tires; the first practical pneumatic tractor tire which led to putting the farm on rubber; and the first balloon or low-pressure tire which has now been developed into the present-day super-balloon.

Inside the main exhibition hall, the display ranges from early carriage tires to 44-ply earthmover tires 9 feet in diameter. Diversity of present-day production as well as its development during the past 50 years are indicated by displays of hundreds of steel, plastic and mechanical rubber products. From the Edison Institute Museum at Detroit came a series of machines depicting the evolution of tire building, including the first drum-type tire building machine.

Of particular interest to workers and their families is a display of employee welfare and safety photos covering a period of many years. Samples of Firestone advertising from the early 1900's to the present day are shown providing an unusual history of merchandising methods since the beginning of the automobile.

On the last two days of the anniversary week, August 4 and 5, the men and women of Firestone and their famiiles were guests of the company at four special performances of Ringling Brothers and Barnum & Bailey Circus. The company purchased all seats for these two days and distributed 37,000 tickets to employees and members of their famiiles.

As the circus appears in other cities in which the company has subsidiary plants, employees and their families will be guests. These include Pottstown, Pennsylvania; Fall River, Massachusetts, and Wyandotte, Michigan, where the circus has already appeared; Memphis, Tennessee; Gastonia, North Carolina; Bennettsville, South Carolina; Noblesville and New Castle, Indiana, and Des Moines, Iowa.

In an interview preceding the dedication ceremonies, Harvey S. Firestone Jr., chairman of the company, noted the rapid reactivation of synthetic rubber plants and declared that these represented "the greatest paid-up insurance policy in the country's history. Assuming the worst, and we do not assume it, the civilian economy will not suffer tire shortages of the severity experienced during World War II," Mr. Firestone declared. "Then we were deprived of our natural rubber resources at a time when synthetic rubber production was on a virtually experimental scale. The situation is vastly different today."

Commenting on the price rise for tires announced by one major producer during the week, Mr. Firestone said it was "amply justified" by rocketing rubber prices, "which have risen some 50 per cent since the start of Korean hostilities."

MARBON REPRESENTATIVES HANDLING TY-PLY SALES AND SERVICE

R. E. Smith — R. B. Sucher — M. E. Jones — R. P. Painter

Effective September 8, sales and service work on its line of Ty-Ply adhesives will be handled direct by the Marbon Corporation. According to the company, all orders and communications concerning Ty-Ply after that date should be directed to the Marbon Corporation, 1926 West 10th Ave., Gary, Indiana.

In connection with the consolidation of its sales activities, the company has made a few changes in its sales organization, as follows: R. P. Painter, with headquarters at 20 Pleasant St., Natick, Mass., will cover the New England states; R. E. Smith, with headquarters at 4 Bruce Lane, Trenton, N. J., will cover New York, New Jersey and adjoining areas; R. B. Sucher, with headquarters in Akron, will cover Ohio and adjoining areas, and M. E. Jones, working out of the Gary headquarters, will cover the Midwestern and Southern territories.

Mr. Painter is a graduate of Ashland College and was most recently associated with the Beebe Rubber Co., Nashua, N. H., as production manager and chief chemist. He was employed for seven years by the Mansfield Tire & Rubber Co. prior to World War II, during which he was associated with the Naval Air Materiel Center at the U. S. Navy Yard in Philadelphia. After the war he joined the Norwalk Tire & Rubber Co. as chief chemist.

Mr. Smith was graduated in 1943 from Queen's University in Canada as a chemical engineer. He has held positions as laboratory supervisor for Canadian Synthetic Rubber, Ltd., at Sarnia, Ontario, and as chief rubber chemist for the Witco Chemical Co. in New York. More recently he was associated with the Plaskon Division of the Libby-Owens-Ford Glass Co. at Toledo, Ohio, as a research engineer.

Mr. Sucher was graduated from Findlay College in 1939, where he majored in chemistry. For the past seven years he has been employed as a rubber compounder in the experimental laboratory of the Inland Manufacturing Division of General Motors at Dayton, Ohio. Prior to joining Inland, he served for five years with the Ohio Oil Co. and for two years with the Cooper Tire & Rubber Corp. Mr. Sucher is the current chairman of the Southern Ohio Rubber Group.

Mr. Jones has been associated with Marbon for the past five years, the last four of which have been in technical sales and service. He had previously devoted his time to technical problems in the laboratory.

Offers Geon Latices Booklet

A new bulletin containing technical data on all its Geon latices, water dispersions of polyvinyl chloride base resins, has been published by the B. F. Goodrich Chemical Co., Cleveland 15, Ohio. The bulletin lists the individual properties of the six latices being marketed. Properties of 4 mil cast film and latex coated papers made with 1 mil coatings are also discussed. Methods used by formulators and fields of application for the material are detailed. Copies of the bulletin are available on request to the company.

Wetherbee Named Cooke Agent

Wetherbee Chemical Co., Buffalo 21, N. Y., has been named sales and technical representatives for the Cooke Color & Chemical Co. of Glen Rock, N. J. Wetherbee will represent Cooke in upstate New York and northwestern Pennsylvania. Burt Wetherbee, owner of the company bearing his name, was recently elected chairman of the Niagara Chapter of the American Institute of Chemists.

FINANCIAL NEWS

National Automotive Fibres, Inc.

First Half: Net profit of $1,556,116, or $1.57 each on 996,145 capital shares, compared with $2,207,771, or $2.31 each on 953,779 shares in the first half of the preceding year. Net sales for the period ended June 30, 1950, amounted to $28,991,920, against $30,885,611 for the period ended June 30, 1949. Figures for 1950 include business of the California Cotton Mills Co. which was merged with National Automotive Fibres on August 1, last.

Dewey and Almy Chemical Co.

First Half: Net profit of $679,770, which is equal to $2.12 per common share, compared with $174,753 for the first six months of the preceding year. Both figures exclude the profits of the 70% owned Argentine subsidiary which were included in the 1949 semi-annual report. Sales in the first half of 1950 amounted to $9,003,491, against $7,446,076 in the first six months of 1949. Argentine sales are also excluded from these figures.

General Tire & Rubber Co.

Six Months Ended May 31: Net profit of $1,666,974, which is equal to $2.44 each on 587,419 common shares, compared with $474,758, or 41 cents each on an equal number of shares for the corresponding period of 1949. Net sales for the period ended May 31, 1950, totaled $45,963,253, against $45,161,156 for the six months ended May 31, 1949.

St. Joseph Lead Co.

First Half: Net income of $4,121,165, which is equal to $2.09 per share, compared with $4,852,390, or $2.46 a share, for the same period last year. Net sales for the first half of 1950 totaled $44,848,764, against $43,546,168 in the first half of 1949. The figures include totals for domestic subsidiaries.

American Cyanamid Co.

First Half: Net earnings of $16,598,401, which is equal to $4.55 each on 3,552,022 common shares, compared with $6,407,248 or $2.09 each on 2,737,686 shares in the first half of 1949. Net sales in the first half of 1950 amounted to $144,247,431, against $113,659,005 a year earlier.

Crown Cork and Seal Co.

First Half: Net income of $732,109, which is equal to 38c a common share, compared with $1,067,708, or 66c a common share in the first half of 1949. Net sales in the first half of 1950 totaled $38,195,422, against $40,519,731 in the first half of the preceding year.

U. S. Rubber Co.

First Half: Net income of $8,848,757, which is equal to $3.55 a share on the common stock, contrasted with $6,655,010, or $2.30 a share in the first half of 1949. The 1950 figure reflects a $1,500,000 reserve for contingencies. Net sales for the 1950 half totaled $291,278,706, against $258,302,914 in the first six months of the preceding year. In the 1950 period, earnings were 3% of sales compared with 2.6% in the corresponding period of 1949.

Monsanto Chemical Co.

First Half: Net income of $13,123,061, which is equal to $2.85 a common share, contrasted with $7,989,858, or $1.72 a share in the first half of 1949. Net sales for the first half of 1950 amounted to $102,704,934, 29% above the total for the first half of the preceding year.

General Cable Corp.

First Half: Net income of $727,000, which is equal to 18c each on 1,917,646 shares of common stock, compared with $1,159,905, or 41c each on an equal number of shares in the first half of the preceding year.

Hewitt-Robins, Inc.

First Half: Net profit of $423,130, which is equal to $1.52 per share on sales of $9,723,324, compared with $246,003, or 88c a share on net sales of $9,971,014 in the first half of the preceding year.

Flintkote Company

From January 1 through July 15: Net income of $3,123,007, which is equal to $2.33 a common share, compared with $2,346,354, or $1.71 a share, for the corresponding period of 1949.

Allen Industries, Inc.

First Half: Net profit of $629,313, which is equal to $1.12 a share on net sales of $15,616,053, compared with $512,212, or 91c a share on sales of $11,906,695 in the first half of 1949.

Rome Cable Corp.

Quarter Ended June 30: Net profit of $260,256, which is equal to 60c a common share, against a net profit of $13,530 for the corresponding quarter of 1949.

Belden Manufacturing Co.

First Half: Net profit of $711,070, which is equal to $2.22 a common share, compared with $191,707, or 60c a share, for the corresponding period of 1949.

Koresin Tackifier Available

Through the cooperation of the Office of Rubber Reserve with General Aniline & Film Corporation, American tire makers will now be able to use koresin to improve the tackiness of synthetic rubber. This is the compound featured in the 1945 "Summary Report" of Rubber Reserve on the production and performance of German synthetic tires. It was used by the Germans during the war, not only to conserve natural rubber, but because a koresin wash was found to be superior to crude rubber cement in improving the tack.

Koresin, now being produced in this country by General Aniline & Film Corporation, is a condensation product of p-tertiary butylphenol with acetylene, in the form of brownish lumps. It is identical with the German product and is equally effective in its tackifying action. Sufficient building tack is produced in milled stock by the use of five to ten percent of koresin, based on the rubber hydrocarbon. In a gasoline solution for coating the surface of rubber stocks, the optimum concentration is from three to four percent.

Koresin is not primarily a softener, but is used in addition to the softener or as a partial replacement. In addition to its use as a tackifier for GR-S rubber stocks and GR-S rubber cements, it has possibilities as a lacquer and varnish resin and as an intermediate for surfactants and tanning agents.

According to data supplied by Antara Products, and measured on a newly devised tack tester, the tackiness increased from 6 to 15 ounces on a sample of GR-S painted with a 4% solution of koresin and from 12 to 27 ounces in a sample of GR-S milled cold with 10% koresin. With only 3% koresin the tack measured 21 ounces.

During the war koresin was itself scarce in Germany, but the tire makers considered it essential in such uses as tread cement and in ply freshening solution and did not permit the use of crude rubber cement for these purposes. According to the Rubber Reserve report, the use of koresin in carcass stock apparently made possible the building of tires without a post-calender dip. In the cementing of plies the Germans used a Buna stock containing about 10% koresin as a basis for the cement.

Joins National Motor Bearing Co.

Ellwood F. "Tom" Riesing, formerly manager of automotive engineering and sales of the Industrial Products Division of the Firestone Tire & Rubber Co., Noblesville, Ind., has joined the National Motor Bearing Co., Redwood City, Calif., as sales manager of the Industrial Division. Mr. Riesing is well known throughout the automotive and associated industries. A graduate of the Engineering School of the University of Wisconsin, Mr. Riesing had been associated with Firestone for 17 years. He holds several dozen patents in the mechanical goods field of bonded-to-metal design, and is the author of numerous technical articles on both metal and synthetic rubber applications.

GOLFING TOURNAMENT FEATURES CHICAGO GROUP SUMMER OUTING

The 1950 Golf Outing of the Chicago Rubber Group was held on July 28, at the Medinah Country Club in Chicago, Ill. Approximately 180 members and their guests participated in the tournament. Charles Skuza (Central Rubber & Mfg.) captured low gross honors for the day with a score of 83. Mr. Skuza received the United Carbon Trophy for his accomplishment. Two men, Francis Frost (Frost Rubber) and Walter Lahey (Goodrich Chemical), tied for second place with a low gross of 84. Mr. Lahey was awarded second place honors and a new United Carbon Trophy by the flip of a coin. Mr. Lahey also was low man on number of putts with 26 for the 18 holes played. Jay Allen (Socony-Vacuum) was second with 27 putts.

Frank E. Smith (Williams-Bowman Rubber) won a prize for the longest drive on a selected hole. Al Berens (Chicago Rawhide) took honors for sinking the longest putt on the 18th green. Closest to the pin on the 9th hole was A. L. Meyer (Herron & Meyer). John S. Ward scored the most fives, 10, while J. Kraft (Kraft Chemical) was awarded a prize for having the most nines over the course.

R. E. Johnson (Anderson-Prichard Oil) won a prize for the most sevens, and J. A. Turny compiled the lowest score on the 12th hole. Clem McLean (American Can) won honors for the highest score on a blind hole by taking 14 strokes on the rough 9th hole. The following members collected prizes for having a net score of 82: Al Vandercoy (Central Rubber & Mfg.), Joe Hanisko (Williams-Bowman Rubber), Skeets Hathaway (U. S. Rubber), Elmo Niccum (Goshen Rubber), and V. Antoine.

Bill Fairclough (Enjay) headed arrangements for the golf outing. His assistants were: Otto Hlavacek (U. S. Rubber), Clarence Bierman (American Can), Dwight Smith (George Cary), Bob Elliott (Indoil Chemical), John Groot (Dryden Rubber), and Charles Wonder (Van Cleef Bros.).

Barlow Joins Cabot Organization

Fred W. Barlow, formerly associated with the Dominion Rubber Co. in Canada and more recently with the research and development laboratories of the Neville Co. in Pittsburgh, Penna., has joined Godfrey L. Cabot, Inc., Boston, Mass., in charge of rubber and plastics testing for the technical service and research and development departments. A graduate of the University of Toronto with the degree of Bachelor of Applied Science, Mr. Barlow has worked in various testing laboratories in Canada in addition to his work with Dominion Rubber where he began as a development engineer in the General Laboratories and was later advanced to group leader of the Hose Development Section. Readers of RUBBER AGE will remember the article on "Some Aspects of Hose Manufacture and Design" by Mr. Barlow which appeared in the August, 1949, issue.

Appointed Technical Director

Clayton F. Ruebensaal

Appointment of Clayton F. Ruebensaal as technical director of plastics and resins for the Naugatuck Chemical Division of the U. S. Rubber Co., Naugatuck, Conn., was recently announced. Mr. Ruebensaal will assume direction of all research, process development and technical service activities pertaining to Kralastic molding powders, Vibrin polyester resins, Marvinol vinyl resins and PQL resins for enamels. A native of Cleveland, Ohio, Mr. Ruebensaal received his chemical engineering degrees from Case Institute of Technology. He was one of the organizers of the Chemical Division of Glenn L. Martin Co., Baltimore, Md., and was in large part responsible for the initial research, development and production of Marvinol resins. He joined U. S. Rubber late in 1949 when the company purchased the assets of Martin's Chemical Division. Mr. Ruebensaal is a member of the American Chemical Society, American Institute of Chemical Engineers, Society of the Plastics Industry, Society of Plastics Engineers and Alpha Chi Sigma, chemical fraternity. He holds numerous United States and foreign patents pertaining to plastics and electro-chemical developments.

Hupfer Retires from Goodrich

Al Hupfer, a member of the public relations department of the B. F. Goodrich Co., and an employee of the company for some 44 years, has retired. He was honored with a dinner and presented with gifts by company friends and associates, the occasion coinciding with his 65th birthday. A native of Easthampton, Mass., Mr. Hupfer came to Akron in 1898 when his father joined the Goodrich organization to establish the rubber thread department. After working summer vacations with the company for a few years he became a permanent employee in 1906, his first job being in the tire repair department. Later, he became the company's first official chauffeur, holding that post until 1939 and driving hundreds of thousands of miles without an accident. Mr. Hupfer has personally known every president of the company with the exception of Dr. Benjamin Franklin Goodrich, its founder and first head.

GOLFING TOURNAMENT FEATURES BUFFALO GROUP ANNUAL OUTING

Approximately 75 members and guests of the Buffalo Rubber Group attended the annual summer outing held on July 14, at the Lancaster Country Club, Lancaster, N. Y. A golfing tournament featured the day's activities which included such other events as horseshoes and a softball game which matched the "In-Towners" with the "Out-Of-Towners." The "Out-Of-Towners" won the game by a score of 6-4. Door and game prizes were distributed.

The Outing Committee consisted of John Augenstein (U. S. Rubber Reclaiming), general chairman; George Bowker (Buffalo Weaving), chairman in charge of outing; Earl Errick (U. S. Rubber Reclaiming) and Paul Sick (Hewitt-Robins), golf prizes; Gene Cimenelli (U. S. Rubber Reclaiming), horseshoes; and Ed Martin, in charge of games.

The group was served a steak and fish dinner and entertained by Les Gilbert (Hercules Gasket), a professional magician. Mr. Augenstein, chairman of the group, introduced S. Murray of the Ontario Rubber Group, who had brought over a small contingent to participate in the Buffalo Group Outing.

Southern Ohio Plans Symposium

On September 14, the Southern Ohio Rubber Group will hold a symposium on "Applied Finishes for Rubber Materials" at the Engineer's Club in Dayton, Ohio. Speakers for the meeting will include Harold R. Bennett, sales manager of the Thresher Paint and Varnish Co., who will speak on "Hard Rubber Finishes," Robert F. Wysocki, technical director of the Forbes Varnish Division, who will speak on "Soft Rubber Finishes," and Fred Bunn, representative for S. C. Johnson & Son Co., who will address the group on "Wax Finishes." M. J. Gordon, president of the Gordon Paint Co., will act as moderator for the session and will speak on "Tailoring the Finish to the Job." A dinner meeting will precede the technical session.

Washington Plans Dinner Meeting

The Washington Rubber Group is making arrangements for its annual dinner and installation of new officers for the 1950-51 season. The combined affair will be held at the Hotel Washington in Washington, D. C., on October 24. John Strohm, journalist and broadcaster of international repute, will present some recent observations of the natural rubber industry in the Far East, and will show some color films taken in Malaya, Indonesia and Indochina. R. E. Harmon (Connecticut Hard Rubber) is heading the dinner committee.

Form Industrial Fabrics Division

Announcement of the formation of an industrial fabrics division to specialize in the weaving of glass, nylon, plastics, rayon and other synthetic fabrics for use in the rubber, plastics and other industries has been made by the St. George Textile Corp., New York 18, N. Y.

NEWS IN BRIEF

Trylyn Manufacturing Co., San Francisco, is currently marketing sandals which can serve as bedroom slippers and beach shoes, as well as being used in the shower, bathtub, locker room, for travel, etc. The many-purpose sandals are made of Bakelite polyethylene.

Jr. Gog, the first water goggle designed especially for children, was recently introduced by Healthways, of Los Angeles, Calif. The goggles offer protection against salt water and chlorinated pool water, often injurious to the eyes. They are made of rubber, attractively tinted in sea green color.

A new mechanical shaft seal assembly recently introduced by Marlow Pumps, of Ridgewood, N. J., on its self-priming centrifugal pumps has as one of its components a rotating seal collar made from Hycar. The collar was especially compounded for good resistance to cold flow or compression set.

A safety education campaign to alert industry, labor and government to the harmful effects of industrial noise upon health, efficiency and production was recently launched by Flents Products Co., of New York. The drive will emphasize the need for adequate protection against industrial noise.

A new type dish drainer made of durable Vinylite resin-coated wire, with the added feature of an attachment for draining eight glasses or cups, is being manufactured by the Artistic Wire Products Co., East Hampton, Conn. It is somewhat larger than conventional dish drainers.

Thermocouples having speed responses up to nine times that of previous models have been developed by the Minneapolis-Honeywell Regulator Co. In addition to stepped-up speed, the new thermocouples are said to be improved by new butt-welding techniques.

A one million dollar improvement program has been launched by General Electric to make its Taunton, Mass., plant one of the largest plastics operations in the country. The plant produces both thermosetting and thermoplastic parts.

A telescopic whisk broom with three different degrees of bristle firmness for serving as many different kinds of purposes, is being made by Emenee Industries, Inc., New York. Both the case and the bristles are made of Bakelite styrene plastic.

A technical bulletin on the use of Indonex plasticizers in polyacrylic rubbers has been made available by the Indoil Chemical Co., Chicago. Ask for Circular No. 13-40.

The diaphragm, valve seat and valve seals of the vacuum release valve used in the new Bendix Economat washing machine, as well as the check valve, are all molded from Hycar. Made by Vernay Laboratories of Yellow Springs, Ohio, all four parts are molded to extremely close tolerances and resist dimensional changes.

A full color plastic relief map of the United States, molded of Vinylite, is currently being marketed by the Aero Service Corp. of Philadelphia. The map measures 64 inches wide by 40 inches deep, yet weighs only two and one-quarter pounds.

U. S. Rubber has presented two genuine rubber trees to the Phipps Conservatory, famous botanical gardens in Pittsburgh, to help round out its collection of rare plants and shrubs gathered from all parts of the world. The trees will eventually attain a height of 30 feet.

The National Safety Council Award of Honor for Distinguished Service to Safety was recently awarded to the Plains Butadiene Plant at Borger, Texas, which is operated for the government by the Phillips Chemical Co. The award was based on 3,001,629 man-hours worked without a lost-time injury.

The first commercial standard for polystyrene plastic wall tile has been issued by the Commodity Standards Division of the National Bureau of Standards. Identified as CS 168-50 Polystyrene Plastic Wall Tiles and Adhesives for Their Application it became effective on July 15.

A technical bulletin entitled "Comparative Study of Burgess Plasticizer W-13 versus Di-Octyl Phthalate in a Vinyl Insulated Compound Loaded with Anhydrous Kaolin Pigment" is available from the Burgess Pigment Co., Paterson 1, N. J.

Vinyl tubing made from Geon, product of Goodrich Chemical, has replaced the rubber latex tubing used in the Venopak unit for intravenous feeding and injections featured by the Abbott Laboratories. The unit is so designed that any number of different solutions can be fed to the patient consecutively through the same tube.

National Safety Council, Chicago, has made available a new training film showing how to handle and unload freight safely. Called "Freight Handling Safety," it is available from the Council in the usual 35 mm sound slidefilm and in a 16 mm film for sound-motion projectors.

Wheelco Instruments Co. has acquired a 50 x 120 foot lot adjoining its six-story building in Chicago. The new property will be used for a warehouse which will be connected with the plant through a loading platform.

A 44-page bulletin giving complete information on its Series 500 lines of thermometers has been made available by the Bristol Co., Waterbury 20, Conn. Liquid-filled, vapor pressure, and gas-filled types are described in models for recording, indicating, controlling and telemetering of temperatures.

An umbrella which can be quickly and easily transformed to harmonize with milady's changing costume is being made by Eichenbaum Umbrella Co., of New York. With a series of different covers made of Vinylite and a specially designed frame, it is possible to change from one color to another in a matter of two to four minutes.

U. S. Rubber recently received a Certificate of Appreciation from the National Society for the Prevention of Blindness in recognition for its outstanding service in helping to promote the Wise Owl Club of America. The club is an eye-safety organization for industrial workers who saved their sight by remembering to wear safety goggles when an accident occurred.

A bathroom mirror which will not fog has been developed by the Charles Parker Co., of Meriden, Conn. It utilizes an electric heater made of electrically-conductive rubber which was designed by U. S. Rubber.

The world's largest injection molding machine for making plastics products was recently installed in the Grenlock, N. J., plant of A. L. Hyde. Designed and manufactured by the Watson-Stillman Co., the machine is capable of pressing out at one time thermoplastic products approximately 200 ounces in weight.

A convenient and informative 8-page bulletin designed and written to take the guesswork and grief out of selecting and using corrugated and solid fiber shipping cases has been issued by Paisley Products, Inc., of New York and Chicago. A special section illustrates and describes all the well-known automatic case sealing machines.

Reprints of the article on "Carbon Black Gel as a Factor in Natural Rubber Reinforcement," which appeared in the April, 1950, issue of RUBBER AGE, have been made available by the Columbian Carbon Co. Copies are available on request.

The steady growth and development of commerce and industry of Metropolitan Kansas City is covered in a special booklet issued in connection with that city's celebration of its centennial. Copies of the booklet are available from the Chamber of Commerce, 1030 Baltimore Ave., Kansas City 6, Mo.

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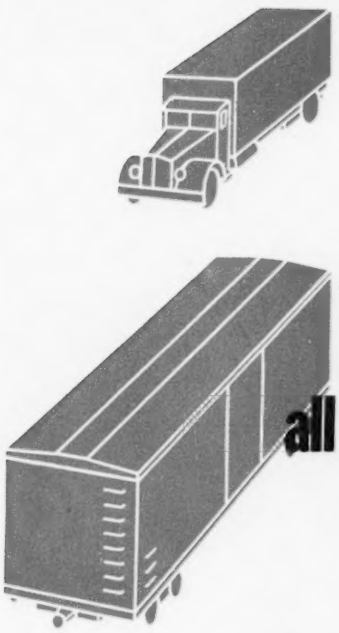

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NEW POLYMERS AUTHORIZED BY OFFICE OF RUBBER RESERVE, RECONSTRUCTION FINANCE CORPORATION

Listed below are types and properties of new experimental GR-S polymers (including GR-S latices) which have been authorized by the Office of Rubber Reserve, Reconstruction Finance Corporation, since publication of those in our previous issue. Procedures for the distribution and sale of these polymers will be found in our October, 1945, issue. Normally, experimental polymers will be produced only at the request of the consumers and 20 bales (one bale weighs approximately 75 pounds) of the original run will be set aside if possible for distribution to other interested companies for their evaluation. The 20 bales when available will be distributed in quantities of one or two bales upon request to the Sales Division of Rubber Reserve or will be held for six months after the experimental polymer was produced unless otherwise consigned before that time. Subsequent production runs will be made if sufficient requests are received to warrant them.

X Number	*Manufacturing Plant*	*Date of Authorization*	*Polymer Description*
X-571 GR-S	U. S. Rubber, Borger	4-4-50	A mixture of 55 parts Philblack O and 100 parts GR-S polymerized at 41° F.; 71.5/28.5 butadiene/styrene charge ratio. Marasperse plus NaOH is used for Philblack O slurry make-up. Emulsified with Dresinate 214. Shortstopped with hydroquinone and hydrogen peroxide. Activated with CHP; stabilized with 1.5% BLE. Shortstopped Mooney viscosity of latex 50.
X-572 GR-S	U. S. Rubber, Borger	5-12-50	GR-S made at 41° F. reaction temperature with a cumene hydroperoxide activated recipe, emulsified with Dresinate 214. Shortstopped with hydroquinone and hydrogen peroxide. Mooney viscosity 50. Stabilized with 1.25% BLE.
X-573 GR-S	U. S. Rubber, Borger	5-26-50	A mixture of 55 parts Huber Aromex HAF black and 100 parts GR-S polymerized at 41° F. Marasperse used in carbon black slurry make-up. Emulsified with Dresinate 214; activated with cumene hydroperoxide. Shortstopped with hydroquinone and hydrogen peroxide. Shortstopped Mooney viscosity of latex 50; stabilized with 1.5% BLE.
X-574 GR-S	Goodyear, Houston	6-6-50	Similar to X-529-GR-S, a mixture containing 50 ± 2 parts EPC black and 100 parts of the same GR-S type polymer as used in GR-S-Black 111 except 75/25 butadiene/styrene charge ratio. Mooney viscosity 37 ± 4, stabilized with 1.5% PBNA. Sodium lignin sulfonate type emulsifying agent used in carbon black slurry make-up.
X-575 GR-S	Goodyear, Houston	6-6-50	Same as GR-S-20 except that the butadiene/styrene charge ratio is 75/25.
X-576 GR-S	Goodrich, Port Neches	6-9-50	Same as GR-S-18 except that the butadiene/styrene charge ratio is 75/25.
X-577 GR-S	Goodrich, Port Neches	6-6-50	Charge ratio, 75/25 butadiene/styrene polymerized at 41° F., emulsified with Dresinate 214. Activated with cumene hydroperoxide; shortstopped with dinitrochlorobenzene and sodium nitrite. Mooney viscosity 52 ± 7. Stabilized with 1.25% Stalite.
X-578 GR-S	Copolymer, Baton Rouge	6-6-50	Similar to X-478 GR-S, except 75/25 butadiene/styrene charge ratio, polymerized at 41° F., emulsified with Dresinate 214, activated with cumene hydroperoxide. Shortstopped with DNCB, stabilized with 1.5% PBNA. Mooney viscosity 55 ± 7.
X-579 GR-S	U. S. Rubber, Borger	6-7-50	Similar to X-457 GR-S, a mixture containing 55 parts Philblack A and 100 parts of the same GR-S type polymer as used in GR-S Black 1 except 75/25 butadiene/styrene charge ratio. Mooney viscosity 37 ± 4, stabilized with 1.5% BLE; Daxad 11 and NaOH used in carbon black slurry make-up.
X-580 GR-S	U. S. Rubber, Borger	6-7-50	Similar to X-571-GR-S, a mixture of 55 parts Philblack O and 100 parts of low temperature polymerized GR-S; Marasperse and NaOH used in carbon black slurry make-up. 75/25 butadiene/styrene charge ratio, emulsified with Dresinate 214. Activated with CHP; shortstopped with hydroquinone and hydrogen peroxide. Shortstopped Mooney viscosity of latex 50. Stabilized with 1.5% BLE. Polymerized at 41° F.
X-581 GR-S	U. S. Rubber, Borger	6-7-50	Similar to X-573-GR-S, a mixture of 55 parts Huber Aromex, HAF black and 100 parts of low temperature polymerized GR-S. Marasperse used in carbon black slurry make-up. Charge ratio is same as given in X-580-GR-S.
X-582 GR-S	U. S. Rubber, Borger	6-7-50	A mixture of 55 parts Vulcan 3 and 100 parts of low temperature, polymerized GR-S. Marasperse and NaOH used in carbon black slurry make-up. Charge ratio is same as given in X-580-GR-S.
X-583 GR-S	U. S. Rubber, Borger	6-7-50	Similar to X-572-GR-S, unpigmented polymer, charge formulation same as given in X-580-GR-S.
X-584 GR-S	U. S. Rubber, Borger	6-7-50	A mixture of 50 parts Philblack O and 100 parts of polybutadiene, Marasperse and NaOH used in carbon black slurry make-up. Charge formulation; 100 parts butadiene, emulsified with Dresinate 214, activated with cumene hydroperoxide; shortstopped with DNCB. Polymerized at 86° F. Mooney viscosity 25. Stabilized with 1.5% BLE.

NOTE: The above new polymers are experimental only and the Office of Rubber Reserve, Reconstruction Finance Corporation, does not make any representations or warranties of any kind, expressed or implied, as to the specifications or properties of such experimental polymers, or the results to be obtained from their use.

NAMES IN THE NEWS

DR. L. P. SEYB, since 1942 a chemist and group leader in the Research Department of the Diamond Alkali Co., Cleveland 15, Ohio, has been named manager of research succeeding J. E. UNDERWOOD, who relinquished the post he held for the past six years to become a research consultant to the company.

J. E. MITCHELL, formerly district manager for the Firestone Tire & Rubber Co. at Milwaukee, Wisc., has been named Western Division manager in charge of original equipment sales for the company.

EDWARD F. KIRIK, associated with the Bond Rubber Corp., Derby, Conn., since 1948, has been elected vice-president of the company in charge of sales.

NILS WALTER SWENSON, formerly manager of mechanical goods sales for the Buffalo, N. Y., branch of the U. S. Rubber Co., has been named assistant manager of branch sales for the Mechanical Goods Division of the company.

KARL J. LEAREY, previously district manager for the General Products Division of the Goodyear Tire & Rubber Co. at Atlanta, Ga., has been appointed manager of Airfoam sales with headquarters in Akron.

A. S. BASIL, formerly general sales manager of the Wire and Cable Department of the U. S. Rubber Co., and most recently associated with the Wire and Cable Division of the Kaiser Aluminum and Chemical Co., Newark, Ohio, as sales manager, has resigned his position with the latter company.

SANFORD B. COUSINS, formerly vice-president and general manager of the New England Telephone and Telegraph Co., has been elected vice-president and a director of Bell Telephone Laboratories and has been named to the additional new post of general manager of the laboratories.

WALTER F. BORGES, formerly sales manager of the Wrought Washer Mfg. Co., Milwaukee, Wisc., has been named vice-president of the company in charge of sales.

C. KENNETH FREEDELL, associated with the Sales and Advertising Departments of the Stanley Tool Division of the Stanley Works, New Britain, Conn., for the past 25 years, has been named general sales manager of the division succeeding ROBERT M. PARSONS, who resigned after 50 years with the company.

R. W. THOMAS, formerly manager of the Research and Development Department of the Phillips Petroleum Co., Bartlesville, Okla., has been elected a vice-president of the company in charge of research and development.

ROBERT E. SHERVEY, formerly associated with the U. S. Gypsum Co., has been appointed sales service representative for the Kraft Chemical Co., Chicago 8, Ill.

FREDERICK S. CARPENTER, director of manufacturing for the U. S. Rubber Export Co., New York 20, N. Y., has been elected a vice-president of the company.

E. J. THOMAS, president of the Goodyear Tire & Rubber Co., has been elected to the executive board of the national council of the Boy Scouts of America.

DR. OTIS D. COLE, assistant director of the chemical and physical research laboratories of the Firestone Tire & Rubber Co., has been voted chairman-elect of the Ohio Chapter of the American Institute of Chemists for the 1950-51 season.

A. POPE LANCASTER has been appointed works manager of the Point Breeze works, the Baltimore, Md., installation of the Western Electric Co. He will also serve in the same capacity for the Allentown, Penna. and the Tonawanda, N. Y., plants, succeeding CLYDE C. RANDOLPH who has been named personnel director at the New York headquarters of the company.

R. H. JUVE, formerly associated with the Goodyear Tire & Rubber Co., has been named technical sales representative of the Ferro Chemical Corp., Bedford, Ohio.

IRVIN H. JONES, previously manager of the Patent Section of the Research Department of Koppers Co., Inc., has been named international development manager of the company.

ROBERT VIGNOLO, formerly assistant to the president and technical director of Turco Products, Inc., Los Angeles 1, Calif., has been appointed Pacific Coast sales manager of the Baker Castor Oil Co., with headquarters in Los Angeles.

GERALD D'AMICO, formerly assistant to Harry P. Bowra, manager of the Boston, Mass., branch of Fritzsche Brothers, Inc., has succeeded to the post made vacant by Mr. Bowra's demise.

DUNCAN C. MENZIES, previously director of Research for Johnson & Johnson, Inc., has been named executive vice-president and general manager of Ball Brothers Co., Inc., Muncie, Ind.

MERTON B. LILLY, formerly associated with the patent law firm of Owen and Owen in Toledo, Ohio, has been appointed head of the patent department of the Wyandotte Chemicals Corp., Wyandotte, Mich.

W. D. SHILTS, secretary of the Goodyear Tire & Rubber Co., was recently awarded a service pin honoring his completion of 45 years with the company.

Reduced Freight Rates in Effect

The Scrap Rubber Institute of the National Association of Waste Material Dealers has announced that according to the General Freight Committee of the Eastern Railroads, the Class 19 rating on scrap rubber between points in official territory was scheduled to have gone into effect on August 15. This reduced freight rate, averaging about 15%, does not include, at the present time, extended zone "C" in Wisconsin and Western Trunk Line Northwest Territory, with whom concurrence has not yet been obtained. It is expected, however, that this will be announced in the near future.

DR. PAUL E. BURCHFIELD, associated with the Wyandotte Chemicals Corp. since 1943, has been appointed director of technical service of the Michigan Alkali Division succeeding CHARLES S. JOHNSON who has retired from active service with the company.

HOWARD L. FRANKS, formerly director of sales for Merrill Brothers in Maspeth, N. Y., has been named manager of sales personnel and control of the Chemical Department of the General Electric Co., Pittsfield, Mass.

ALLEN H. OTIMAN, vice-president and controller of the American Hard Rubber Co., New York 12, N. Y., has been elected first vice-president of the New York Chapter of the National Association of Cost Accountants.

DR. MAX T. GOEBEL, assistant technical director of the DuPont Grasselli Chemicals Department, has been appointed technical director, succeeding DR. JOHN C. WOODHOUSE who has undertaken a special assignment with the company.

BRADLEY DEWEY, JR., has been appointed manager of the Cryovac Division of the Dewey and Almy Chemical Co., Cambridge, Mass., succeeding JOHN A. LUNN who recently left the company to join the Kendall Co.

M. W. SLEDGE, formerly assistant manager of the Belt Sales Department of the Goodyear Tire & Rubber Co., has been named manager of the department to succeed the late E. W. STEPHENS. H. R. HARRINGTON, former senior staffman, is the new assistant manager.

J. J. GOLDIE, associated with the General Tire & Rubber Co. since 1926, has been named manager of distribution for the company. He will be in charge of the complete distribution of all finished goods inventories, casings, tubes, repair materials, etc.

LINCOLN T. WORK, formerly associated with the Powdered Material Research Laboratories at Cambridge, Mass., now has office space with Singmaster & Breyer in New York City. He is a consulting engineer.

Named Hydraulic Press Manager

R. G. Tabors

R. G. Tabors, formerly sales manager of the Press and Power Tool Department of the Baldwin Locomotive Works, Philadelphia 42, Penna., has been named manager of the Hydraulic Press and Power Tool Department of the company. Mr. Tabors was born in Chicago, Ill., and received his early education in the public schools of Cleveland, Ohio. He graduated from Case Institute of Technology with a B. S. degree in mechanical engineering in 1935, and received his M. S. degree from the same institution in 1937. He joined the Baldwin organization in February, 1937, and served as sales engineer until 1943 when he entered military service. Mr. Tabors returned to Baldwin in January, 1948, as manager of the Press and Power Tool Department, which position he held until his recent appointment. At the same time it was announced that M. L. Hall, formerly manager of Testing Equipment Sales, has been appointed manager of the Testing Equipment Department. George F. Walsh, previously sales promotion manager of the Testing Equipment Department, has been named sales promotion manager to cover the promotion and advertising of all product groups.

Two Exporters Penalized

Two exporters of rubber chemicals and compounding ingredients have had their export license privileges revoked by the Commerce Department in recent weeks. In both instances, the charge covered attempts to ship chemicals behind the iron curtain. According to the Department's Office of Industry and Commerce, the privileges of Leon N. Rodell, of New York City, were revoked for trying to secure an export permit for 66,000 pounds of tetra ethyl thiuram disulfide by listing Switzerland as the destination, while those of Rolf G. Grote, also of New York, were revoked on the grounds that he shipped 231,000 pounds of tetra methyl and tetra ethyl thiuram disulfide to Switzerland, allegedly knowing when he applied for licenses that the materials were to be transshipped at Antwerp and sent to Russia. Nine separate shipments of the chemicals were involved in the latter instance.

LABOR NOTES

All members of the Big Four have been notified that the United Rubber Workers (CIO) wants to begin negotiating another round of wage increases. Contracts with these companies run into 1951, but all of them have wage-reopening clauses. The rubber union is reported to be seeking a general 25-cent-an-hour raise, a 6-cent increase to correct area and plant differentials, and a further raise based on the cost-of-living index of the Bureau of Labor Statistics. The decision to re-open wage negotiations was made at a two-day meeting of the union's policy committee in Columbus, Ohio, on July 24 and 25.

Tire production returned to normal at the Goodrich plant in Akron on July 17 following a week-long wildcat strike. The work stoppage is reported to have begun when union tire workers protested that three non-union workers were overproducing and walked off their jobs when the company refused to limit production. The strikers resumed work on the condition that the dispute would be processed immediately.

The rubber local at the International Shoe Co. plant in Hannibal, Mo., lost a National Labor Relations Board action by default last month. The local failed to appear when the Board held a hearing on charges brought by it against the company, the charges growing out of a bitter bargaining session between the union and the company last year. The trial examiner at the hearing dismissed the union's complaint and certified his findings to Washington. The union has appealed the decision.

The Columbia Chemical Division of Pittsburgh Plate Glass Co. has signed a three-year closed contract with the Allied Chemical Workers, an independent union, at the company's plant in Barberton, Ohio. Union employees were granted a 5 cents-an-hour general wage increase immediately, 5 cents more on June 28, 1951, and a third wage hike on June 28, 1952. Other concessions were also made.

ECA Adds to Rubber Stockpile

The Economic Cooperation Administration has estimated that enough rubber to produce 7,000,000 automobile tires has been purchased from Marshall Plan countries by the ECA. All of this rubber, however, goes into the U. S. Government stockpile which is now building up its supply of strategic materials. The rubber, if used, is slated for military uses. The rubber, together with other scarce items, is pouring into the United States at a rate equivalent to $2,000,000 a month, with little or no cost to the American taxpayer. Purchases are made with ECA's 5% share of counterpart funds, foreign currency deposited by Marshall Plan countries to match ECA dollar grants. The 5% account is reserved exclusively for the United States. ECA's direct purchases as of June 30, 1950, total $61.1 million of which $26.8 million is rubber.

Heads New Akron Standard Plant

W. H. Ruttenberg

William H. Ruttenberg, associated with the Akron Standard Mold Co., Akron 5, Ohio, since December, 1949, has been named superintendent of the new mechanical mold plant recently built by the company. Mr. Ruttenberg was born on July 29, 1894 in Akron, and began his business career with the Quaker Oats Co. He served an apprenticeship at the Wellman, Seaver, Morgan Co. of Akron, and left there to work for the Akron Gear and Engineering Co., where he rose to the position of foreman. Some time later, Mr. Ruttenberg left Akron Gear to join the International Harvester Co. When that company moved its facilities to Fort Wayne, Ind., he decide to remain in Akron and joined the Mechanical Mold and Machine Co. In a short time he was named foreman and later was promoted to superintendent. Mr. Ruttenberg remained with Mechanical Mold for 28 years, or until the time he joined Akron Standard. At the latter company, he immediately began the purchase of machinery and worked on the layout for the new mechanical mold plant which the company planned to build. With the recent completion of this plant, Mr. Ruttenberg was named its superintendent.

Open Dunlop Center in England

Formal opening of the new Dunlop Research Center at Fort Dunlop, Erdington, Birmingham, England, took place on June 7. Although it was originally planned to construct an entirely new group of buildings, general conditions after the war made such a course impractical, and accordingly the new center represents modification of some previous buildings, plus additional buildings acquired in the area. Total floor space of the new center is approximately 154,000 square feet, of which the two-floor laboratory building represents 129,000 square feet, the pilot plant building 18,500, the services building 2,400, and an annex 4,250. There are some 50 fully-equipped laboratories in the center, grouped under the two broad headings of research and development, and approximately 270 people are employed.

Economic Aid for Far East

Pointing out that Southeast Asia is "one of the danger spots in the world where we haven't any time to lose," Paul G. Hoffman, Economic Cooperation Administrator, recently announced that ECA, in consultation with the State Department, is readying a staff of experts to send to that area to assist in administering a new type of economic aid. He added that a Far East Program Division has been established in Washington, with Harlan Cleveland, now deputy to the ECA Assistant Administrator for Program, as acting director. Establishment of a Special Technical and Economic Mission (STEM) to the associated states of Indo-China was also announced. Other ECA missions to strategic areas in Southeast Asia are in prospect. ECA officials pointed out that the new program would not follow the pattern of Marshall Plan aid to Europe. Therefore, ECA aid in Southeast Asia may be a forerunner of the Point Four type of aid in which underdeveloped areas are given basic assistance in economic development.

Consolidate Two Associations

A new association has been organized under the name of the Manufacturing Chemists' Association, Inc., representing a consolidation of the Manufacturing Chemists' Association, Inc., and the Plastic Materials Manufacturers Association, Inc., Approval of the consolidation was unanimously given by members of both organizations at recent meetings. The Washington offices of the associations will be merged in the near future. M. F. Crass, J.,, association secretary, will be in charge of the combined office, while F. H. Carman will continue to direct the plastic programs.

Government Sues United Engineering

In a suit filed on June 26 the Federal Government charged the United Engineering and Foundry Co. of Pittsburgh, Penna., and thirteen foreign concerns with participation in an illegal international cartel to divide the world market in rolling mill machinery and equipment. United Engineering is one of the world's largest producers of rolling machinery, which is essential to modern-day output of steel and metal products. The government's complaint said that under the cartel each company involved agreed to restrict its output to "an agreed territory."

Experimental Cutting Laboratory

Taylor, Stiles & Co., Riegelsville, N. J., has set up a completely equipped testing laboratory at their Riegelsville plant for the test cutting of materials of any kind to any specifications. There is no charge for this service unless the quantity of stock to be cut runs into production amounts, in which case a nominal charge is made to cover the actual cost of the cutting process. The Riegelsville installation includes cutters for shredding, dicing, etc., all of the latest and most efficient types.

Atomic Golf Ball

The answer to a golfer's dream —an atomic golf ball that can't get lost—was recently demonstrated in Akron. Minute quantities of radioactive materials embedded under the cover of the ball makes it possible for a caddy carrying a small, portable Geiger Counter to locate the ball even when hidden in dense woods or deep rough. The atomic golf ball was developed by Dr. William L. Davidson, director of physical research at the B. F. Goodrich Research Center in Brecksville, Ohio. The project was purely experimental and no sale of radioactive golf balls is contemplated at present.

Two New Vinyl Stabilizers

Two new stabilizers for vinyl plastics, called Dutch Boy Plumb-O-Sil C and Plumb-O-Sil D, have been announced by the National Lead Co., New York 6, N. Y. Both are co-precipitates of lead orthosilicate and silica gel and are said to be characterized by easy dispersion in vinyl plastic products. Used primarily in translucent compounds, they impart heat and light stability to vinyl plastics. At the same time, it was announced that production of Dyphos (dibasic lead phosphite), another National Lead vinyl plastics stabilizer, has been stepped-up to meet demand. Dyphos is used in opaque vinyl compounds where exceptional heat and light stability is required.

Evaluating Crosswind Wheels

Installation of seven sets of crosswind wheels on T-6 Texan trainers was recently announced by the U. S. Air Force. The castered wheels, manufactured by the Goodyear Tire & Rubber Co., are the first to be designed especially for military aircraft. The wheels are designed to caster 30 degrees on either side of the center line of the airplane, a provision that will allow the aircraft to land in winds up to 40 mph 90 degrees across the runway. Evaluation of the new crosswind wheels will be made by both Wright Field and the Randolph Air Force Base.

Bibliography on Administration

A carefully selected bibliography of books and articles on the management of industrial research, originally compiled for the use of the company's staff members, is now being offered to industry without charge by Arthur D. Little, Inc., Cambridge 42, Mass. The company was prompted to make the bibliography generally available because of the interest shown by many organizations in a fundamental review of their research policies, objectives, procedures, and programs. The bibliography includes 96 separate references on the subject.

Vinyl Film for Baby Pants

A new vinyl film for baby pants which will withstand repeated hot soapy water washings without losing its flexibility or its color has been developed by the Goodyear Tire & Rubber Co. The material can be electronically sealed, and has been boiled in Goodyear's Development laboratories for as long as 60 hours in clear water and 12 hours in hot sudsy water without any damaging effects. It is being produced in a wide range of translucent colors on which silk screen pattern printing is possible. The H. H. Cutler Company of Grand Rapids, Michigan, is using the material in their line of Cuvver-ups. These are so designed to give fullness at the waist and legs for ease in putting on or removing. Another feature is the installation of vents for escape of body heat, while still giving complete protection against leakage. On the technical side, Goodyear announced the material is a 4 mil calendered film, making use of Pliovic vinyl resins and special plasticizers.

Nelson Employment Expanding

The Nelson Employment Service, Buckeye Building, Akron 8, Ohio, which was organized by Harold Nelson about a year ago, is expanding its services on a nationwide basis. Heretofore the company concentrated its operations to a large extent in the Ohio area. Mr. Nelson was formerly associated with the Goodyear Tire & Rubber Co., holding responsible positions in administrative engineering, purchasing, sales and production control. His company is staffed with experienced personnel specialists and dosiers of a large number of well-trained rubber technologists, engineers, etc., are on file. The company specializes in the employment problems of the rubber industry.

Harwick Polycizors 332 and 162

Two new plasticizers known as Polycizer 332 and Polycizer 162 are being distributed by the Harwick Standard Chemical Co., Akron, Ohio, for use in compounding vinyl and other synthetic resins as well as rubbers. These plasticizers are reputed to have good heat and light stabiltiy, excellent stress-strain properties, and good low temperature properties. Polycizer 332 is an odorless dioctyl adipate that is low in acid and practically colorless. Polycizer 162 is classified as dioctyl phthalate and is recommended as an all-purpose plasticizer for use with all types of resins. It is practically odorless and colorless.

Opens New Safety Laboratory

Mine Safety Appliances Co. recently opened a new $500,000 safety equipment research laboratory at Pittsburgh, Penna. The laboratory's facilities will be devoted to the development of devices for shielding humans against all types of industrial hazards. Research equipment in the new four-story building includes high altitude and low temperature chambers, a wind tunnel and an electronic microscope that permits study of dusts and other substances at a magnification up to 100,000 times.

Norwalk Tire Sale Completed

Final papers in the sale of the bankrupt Norwalk Tire & Rubber Co. of Norwalk, Conn., to Albert M. Kahn of New York City for $2,600,000 were signed on July 12 in Federal Court, New Haven, Conn. Mr. Kahn's bid topped by $50,000 an offer by the Aetna Industrial Corp. of New York City. His bid came as a surprise on June 7 at a meeting held to confirm the Aetna purchase. Mr. Kahn's bid was confirmed at that time. The Norwalk company went into bankruptcy in May, 1949. Later, hearings were held on reorganizational possibilities to keep the plant in operation. A protective committee for the company's 4% convertible debentures has announced that it has been notified by the trustee that sufficient assets have been obtained from securities holders to put the reorganization plan for Norwalk Tire into effect. The trustee estimated the amount immediately available for holders of the $1,268,500 debentures will be about 100% of principal. On July 28, Walter W. DeLaney, trustee for the company, announced that an immediate distribution of 80% of the principal value of the 4% convertible debentures is being made. On August 8, the New York Stock Exchange asked the Securities and Exchange Commission for authority to strike from its listings the common stock of the company. At this writing, the Norwalk plant is not in operation, the plant having closed without prior notice late in July.

Deny Tire Rationing Plans

Reports and rumors concerning impending rationing of tires on a basis similar to that which existed during World War II have been popping up all over the country. At least two officials in Washington have scotched the rumors in definite terms. Arthur Wolf, who heads the Rubber Section of the National Security Resources Board, pointed out that "we do not have the authority to ration tires" and added that to his knowledge "no one contemplates going to Congress to ask for the authority." Earl W. Glen, chief of the rubber program for the Commerce Department, branded the reports as being "absolutely untrue," but stated that if our supplies of natural rubber from the Far East are threatened "something will have to be considered." He added, however, that at the present time we are a long way from such a situation.

Offers Hab-U-Co Resin Emulsions

An extensive line of resin emulsion is currently being offered to industry by Hadley Bros.-Uhl Co., 514 Calvary Ave., St. Louis 15, Mo. Called Hab-U-Co Resin Emulsions, they may be used as extenders to replace a high percentage of the rubber content in latex cements or as tackifiers to modify the degree of tackiness desired in the dry cement film. The emulsions are light in color, thus precluding any undue staining or discoloration of cemented surfaces.

Heads Plasticizers Division

John Andrews

John Andrews, for the past four years a member of the technical sales staff of Godfrey L. Cabot, Inc., Boston 10, Mass., has been appointed general manager of the newly created Plasticizers Division of the company. As Cabot's new manager of plasticizers, Mr. Andrews will also call on Cabot customers in this field. Immediately after his discharge from the United States Army Air Force in 1945, Mr. Andrews joined the Cabot company, beginning work in the Special Blacks Laboratory. Following a brief indoctrination period, he was assigned to the sales department with the particular job of selling rubber blacks and special carbon blacks. His background and experience before coming to Cabot include three years of research and laboratory work in the chemical industry. He was graduated from Tufts College School of Engineering in 1937, with a B.S. degree in chemical engineering.

FTC Halts Footwear Discounts

The Federal Trade Commission, in an action taken in Washington, D. C. on July 10, ordered the U. S. Rubber Co. to discontinue the sale of private brand footwear to chains and mail order houses at "unlawful" discounts. The commission objected to the fact that chains were able to buy private brands of rubber footwear at a lower price than U. S. Rubber charged for its advertised brands of like grade and quality. Except for due allowance for differences in manufacturing and sales costs, there must be no discrimination in the price charged purchasers of footwear of like grade and quality, the FTC said.

Advance Tire Cord Prices

The price of high tenacity rayon yarn, used in the manufacture of tire cord, was advanced 3 cents a pound late last month. Similar announcements of the increase were made by American Viscose, Industrial Rayon and DuPont. The new prices, attributed to higher material and operating costs, are 58 cents a pound for 1100/480 cord and 57 cents a pound for 1650/720 cord.

A.S.T.M. Holds 53rd Meeting

The 53rd Annual Meeting of the American Society for Testing Materials was held in Atlantic City, N. J., from June 26 to 30, with a record attendance of 2,134. Over 20 formal technical sessions were held with upwards of 500 meetings of the various technical committees. The Apparatus Exhibit, a feature of these meetings, included many new testing and research instruments and equipment, while the Photographic Exhibit, another standard feature, included many excellent examples of photomicrographs. New officers for 1950-51 elected at the meeting included L. J. Markwardt, of the U. S. Forest Products Laboratory, Madison, Wisc., as president, and T. S. Fuller, of the General Electric Co., Schenectady, N. Y., vice-president. B. A. Anderton, of the Barrett Division of the Allied Chemical and Dye Corp., was among those elected to the board of directors. Awards of Merit were given to nine technical men including Alfred P. S. Bellis, formerly chief electrical engineer of the John A. Roebling's Sons Co., now retired, and Percy H. Walker, formerly chief of the chemistry division of the National Bureau of Standards, also retired. A comprehensive report on the various meetings held by subcommittees of Committee D-11 on Rubber and Rubberlike Products will appear in an early issue.

Akron Section Elects Officers

The Akron Section of the American Chemical Society in a recent meeting held in Akron, Ohio, elected new officers for the 1951 season. Dr. G. E. P. Smith, Jr., (Firestone) was elected chairman; Dr. G. H. Stempel, Jr., (General Tire), vice-chairman; B. L. Johnson (Firestone), secretary, and Dr. John R. Schaefgen (Goodyear), treasurer. E. A. Willson (Goodrich) was named councilor for a three-month term and A. J. Gracia (Goodyear), alternate councilor. In the Akron section, progression from vice-chairman to chairman is automatic, which means that Dr. Stempel will head the organization for the 1952 season. All the officers were elected for one year and assume office immediately although the first regular monthly meeting of the group will not be held until September.

Cabot Opens British Black Plant

Cabot Carbon, Ltd., a wholly-owned British subsidiary of Godfrey L. Cabot, Inc., Boston, Mass., has opened its new Stanlow carbon black plant at Ellesmere Port, Cheshire, England. The plant, which cost about $1,400,000, represents one of the first overseas ventures by American capital under an ECA convertibility guarantee. Until now, Britain's carbon black requirements have been met by imports, mostly from the United States. It is expected that the new plant will save Great Britain more than $1,000,000 annually. When in full operation, the factory will produce about 20,000,000 pounds of high abrasion carbon black a year.

NEW RUBBER GOODS

Rubber Fenders for Street Cars

Development of a rubber fender for street cars which is said to outwear metal and to have eliminated fender maintenance costs for the Detroit Street Railway Department, has been announced by the U. S. Rubber Co. Trial tests have been so successful that rubber fenders have been

specified on 106 new cars purchased by the department. In addition, steel fenders are being replaced with rubber on all cars now in service. The fenders are constructed of layers of neoprene to resist gasoline and oil with a layer of fabric reinforcement. The undersurface of each fender has a ribbed design for additional strength.

Rubber Cleated Baseball Shoes

U. S. Rubber Co., New York 20, N. Y., is now producing a special baseball shoe for amateur sports. Designed for safety, comfort and long wear, it is made with a molded, rubber cleated sole, to insure fast stops and good grip on grass and skin diamonds while eliminating the danger of spiking during play. The shoe, known as Little League Keds, was recently approved for play in Little League baseball, which includes boys from 8 to 12 years old. It is washable, with an upper of black army duck. A hard rubber toe cap gives added protection to the toes of the players. Other features are a flexible rubber instep, shockproof arch cushion and cushioned insole and heel. Little League Keds are made in both boys' and men's sizes and are suitable for softball as well as baseball.

A new inflatable dress form for children made of Vinylite has been introduced by Barbera Originals, Inc., New York. It is reported to be a wonderful aid in making children's clothes, for changing hemlines, and for blocking and drying sweaters and other garments.

Griprite Industrial Rubber Gloves

A new industrial rubber glove called "Griprite" has been announced by B. F. Goodrich Co., Akron, Ohio. Made with a roughened surface which is an integral part of the glove, it insures a firm tight grip even in the wettest application allowing work under these conditions to be accomplished with ease and speed. The glove enables the wearer to grip the smallest objects firmly and with confidence. Goodrich said advantages of the glove are its high tensile, uniform strength, excellent snag and tear resistance, highly flexible and strong finger crotch. Among the industries which have particular use for this type glove are the pickling and plating plants, battery manufacturers, chemical plants, packers and other food plants, acid and alkali manufacturers, photograph equipment makers and plywood manufacturers.

Rextrude Tennis Court Tape

A tennis court tape made of Geon plastic, product of the B. F. Goodrich Chemical Co., has been introduced by the Rex Corp. of Cambridge, Mass. Called "Rextrude," the tape may be used for marking base lines, service lines, double and half court lines. It is said to possess exceptional resistance to aging, weathering, most acids, alkalies and sunlight. The Rex Company supplies the tape in two different sets, one, a "Professional" designed for courts where playing traffic is light, the other, a "Heavy-Duty" for use on country club and public courts where playing traffic is very heavy. The tapes are either stapled to the ground or secured with 2½-inch aluminum nails.

Vinylite Bath Tub Trainer

Plastictronics, Inc., 54 Greene St., New York, N. Y., has introduced an inflatable bath tub boat made of Vinylite plastic. The new unit is said to transform baby's daily

bathing routine from a period of fright and tears to a pleasant playtime. Easily inflated and deflated and compactly stored, the 36-inch boat weighs only slightly more than one pound and can also be used on a rope in a pool or pond.

Goodyear Hy-T V-Belts

A new line of super-rated V-belts, named Hy-T, incorporating a chemically produced fiber of extremely high-strength, low-stretch and excellent shock absorbing qualities, has been developed by the Goodyear Tire & Rubber Co., Akron, Ohio. Company officials said the new synthetic cord is also water and mildew resistant. The great strength of the new fiber enables the Hy-T belt to handle 40% more horsepower than standard multi-V-belts without excessive stretch. Inherent resistance to shrinking is another advantage of the new fiber. The other materials which form the outside covering of the Hy-T have been treated with a mildew inhibiting agent assuring maximum protection from malignant growth.

Inflatable Vinylite Bath Lounge

A new inflatable bath lounge made of Vinylite and designed for users of all ages is being produced by Luxury Gifts, Inc., 516 Fifth Avenue, New York 18, N. Y. Weighing only slightly more than one pound, and quickly inflated or deflated,

the bath aid has a comfortable seat, back support and head rest. Before filling the tub with water, the inflated lounge is placed in the desired position. Suction cups on the bottom hold it in place firmly and safely. The Vinylite plastic sheeting is unaffected by water, soap, alkali, alcohol and temperature changes.

Bakelite Polyethylene Insulation

Bishop Manufacturing Corp., 254 West 31st St., New York 1, N. Y., has developed a new insulating and splicing tape based on Bakelite polyethylene resins which welds into a continuous elastic skin within a few minutes after application. The tape is said to be unaffected by temperatures ranging from 120° to as low as —30°F. The seal made with this tape requires no adhesive material, and is a positive, permanent, moisture and air-tight seal. It is unaffected by corrosive fumes, ozone, sunlight and oxygen. For application, the tape is stretched two or three types normal length, then wrapped normally. Both clear and black forms of the tape are produced.

For extruded and calendered **VINYL** *products*

A NEW PLASTICIZER

MORFLEX 100*

An improved octyl phthalate type of plasticizer characterized by high efficiency, low volatility and migration, good electrical properties, and of outstanding resistance to heat aging as demonstrated by high retention of elongation and light transmission.

FOR EXAMPLE:

the following independent laboratory data illustrate the possibility of using only one type of plasticizer in a vinyl insulating compound for operating temperatures up to 90° C.

TEST FORMULA	1	2	3	4
Polyvinyl chloride	100	100	100	100
MORFLEX 100	50	60	—	—
Di-octyl phthalate	—	—	50	60
Burgess Pigment #30 (U.S. Pat. No. 2,307,239)	7	7	7	7
Basic Carb. White Lead	10	10	10	10
TEST RESULTS				
Modulus — 200%	2100	2000	2050	1900
Tensile	2850	2650	2850	2650
% Elongation	325	365	320	380
Shore A Hardness	85	80	85	80
% Change After Aging 7 Days at 121° C.				
Tensile	—7.	+2.	—3.5	—5.5
Elongation	—7.	—13.	—33.	—46.

Although the above data were obtained on a vinyl insulating compound, these characteristics of MORFLEX 100 should be equally interesting to compounders of vinyl coatings, unsupported film or sheeting, tile, hose, linoleum, and other vinyl products in which good flex and permanency are desired.

*MANUFACTURED BY MORTON-WITHERS CHEMICAL CO.,
2110 HIGH POINT ROAD, GREENSBORO, N. C.

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Executive Sales Office: **64 Hamilton Street, Paterson, N. J.**
Chicago Area: **WALTER HERRS, 40 Custer Street, Lemont, Ill.**
West Coast: **MERIT WESTERN COMPANY, GEORGE R. STEINBACH, 1248 Wholesale St., Los Angeles 21, Calif.**

CANADIAN NEWS

Motorists may soon be riding over roads made, in part, of powdered rubber, the Engineering Institute of Canada at Toronto was told recently by W. A. Clarke, executive assistant to the chief engineer, Ontario Highways Department.

"Bituminous or flexible type pavements are used primarily because they are adaptable to stage construction," Mr. Clarke said. "The low-cost type may be built with local labor, materials and equipment, easily operated and patched. It has no joints and has resilient riding qualities.

"Our chief worry in the construction of flexible or bituminous pavements is the control of frost heaving," Mr. Clarke said. "We have had some success in this respect by the addition of granular material under our pavements. Although heaving does take place, it is uniform and, therefore, serious failures have been eliminated."

Prices of passenger car tires in Canada have been increased by approximately 7½%. Initial announcement of the higher prices, said to be forced by the rising cost of natural rubber, was made by Goodyear, with similar announcements made by other Canadian tire producers shortly thereafter. The disturbing news from Korea has pushed the sales of tires up by as much as 15%, but the trade does not regard the action as anything approaching panic buying. There are some reports of motorists refusing to trade in old tires when purchasing new sets.

Consumption of rubber increased 6 per cent in May, the Dominion Bureau of Statistics has reported. Total for the month amounted to 14,690,900 pounds, compared with 13,842,200 in April. Natural rubber consumption increased to 8,035,600 pounds from 7,790,000; synthetic to 4,114,100 pounds from 3,678,100. Domestic production of synthetic rubber moved higher in May, totalling 10,626,600 pounds, compared with 10,313,000 in the preceding month. Month-end stocks of natural rubber rose to 12,799,400 pounds from 11,809,300 in April, while synthetic declined to 8,832,300 pounds from 10,528,000.

E. R. Rowzee, manager of the Polymer Corporation, Ltd., for the past three years, has been elected to the board of directors of that Crown-owned company. He replaces D. W. Ambridge of Toronto. Mr. Rowzee came to Canada in 1942 on loan from the Goodyear Tire & Rubber Co., Akron, to act as manager of Canadian Synthetic Rubber, Ltd., one of Polymer's operating companies. In 1944, he severed his connection with the American firm to accept the position of director of research for the Polymer Corporation. Three years ago he was advanced to the position of manager.

The appointment of Sidney Parkes as sales manager of the Industrial Rubber Products Division of the Dunlop Tire and Rubber Goods Co., Ltd., has been announced by Harry S. Pritchard, general sales manager. Mr. Parkes, until recently Ontario Branch Sales Manager of the division, has been associated with the Dunlop organization for some seventeen years, specializing in technical, product design, and sales problems.

While rumors continue to pile up about further large-scale developments for Sarnia's chemical valley, one concrete step was announced recently: Susquehanna Pipe Line Co.—a Sun Oil affiliate—will build a 125-mile petroleum products pipeline from Sun Oil's Toledo, Ohio, refinery to Sarnia. The line will carry liquefied gases to Polymer Corp. for use in synthetic rubber production.

While the pipeline will not immediately represent any important step-up in Canadian synthetic rubber production—since Polymer is currently operating at physical capacity—it will provide greater flexibility in supplies and make possible increased rubber output if the demand suddenly arises and plant capacity is increased.

Running north of Toledo to Detroit then northeast from south of Pontiac, Michigan, the line will cross the St. Clair river at Marysville, Mich., and thence to Sarnia, Ont., on the Canadian side. The crossing will be from 45 to 50 ft. deep, with the line laid 12 feet below the stream bed to safeguard against damage from anchors of lake vessels. A pump station powered by a 400 hp electric motor will move the products through the line at a maximum rate of 600 barrels an hour or about 14,000 barrels a day.

The United States would be serving its best interests by purchasing more in Canada, O. H. Barrett, assistant to the president of the Goodyear Tire and Rubber Co. of Canada, told the National Industrial Advertisers Association convention in Los Angeles recently.

"For upon this," declared Mr. Barrett, "depends Canada's ability to close the gap in out-trading payments, her ability to buy more from you, her ability to adequately arm herself with you in the defense of this continent and to continue the development of a free and vigorous democracy on your most important northern border."

In oil and iron Canada has hit a fabulous "double jackpot," Mr. Barrett said. "In these great developments, Canadian-U.S. co-operationd and indeed partnership action, will play a significant part." He referred to the building of the St. Lawrence waterway as a "great challenge which stands before us both."

T. M. Mayberry, vice-president and treasurer of the Firestone Tire & Rubber Co. of Canada, Ltd., was recently appointed executive vice-president of that company.

Additional Tire Price Rises

Prices of original equipment tires were advanced last month, the initial announcement being made on July 11 by the Firestone Tire & Rubber Co. and quickly followed by other tire manufacturers. The increases amounted to 8 to 10% for passengers car tires, 12½% for truck and bus tires, and 6% for farm tractor and implement casings. These increases were the first advance in original equipment tires since last January, when a 5% increase was instituted. It was estimated that the new prices of original equipment tires would add about $4.00 per car for the popular makes. Firestone again set an industry pattern on July 18 when it announced additional increases of 5 to 7½% on replacement tires. Replacement passenger tires were increased 5%, standard truck tires 5%, tractor and farm implement tires 5%, special truck and bus and off-the-road tires 7½%, industrial solid tires 7½%, and synthetic rubber tubes 5%. The new increase lifts the price of Firestone's first line 6.00-16 passenger tire, for example, from $16.20 to $17.00, plus excise taxes. The increase in replacement tire prices is the second this year on passenger tires and the third on bus and truck tires. Most companies cited the steadily increasing prices of natural rubber as the reason for the adjusted prices.

LOS ANGELES NEWS

Goodrich has added manufacturing equipment at its local plant for the manufacture of off-the-road tires. The equipment was installed and schedules expanded as a result of growing demand for off-the-road tires from Western construction, mining and logging industries, according to L. R. Keltner, plant manager. A slight increase in employment at the factory is anticipated as a result of the new schedules.

Fred G. Rumball, director of purchasing on the West Coast for the Ford Motor Co., died at his home in Los Angeles on July 30, following a heart attack. He was 52 years of age. Mr. Rumball was well known to many rubber manufacturers in this area, having worked closely with several of them on Ford's numerous requirements. A native of London, Ont., Canada, Mr. Rumball came to Southern California in 1940 after a sales career that took him into every state. His father and one daughter survive.

General Tire & Rubber Co. has opened a new building, said to cost approximately $335,000, which houses a general shipping department, sales office and warehouse. The 50,000 square foot structure has about twice the space of the one formerly leased by the company in the city. About a dozen new employees have been hired for the warehouse and sales office.

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OBITUARIES

A. B. Cowdery

A. B. Cowdery, associated with the Barrett Division of the Allied Chemical & Dye Corporation from 1902 until his official retirement from active business in January, 1948, died at his home in Harwichport, Mass., on July 9, following a stroke suffered three weeks earlier. He was 78 years of age. Mr. Cowdery, for many years in charge of sales of all Barrett rubber chemicals and compounding ingredients, started with the company when it was still customary to pile boxes and drums of chemicals in the back of a horse-drawn wagon and literally peddle them from factory to factory. There were few rubber factories in existence at the time, especially those in the New England area, at which Mr. Cowdery's horse-and-wagon was not a familiar sight. One of Mr. Cowdery's duties with Barrett was to "break in" new rubber salesmen. Although ill and practically inactive for many years, he did not "officially" retire from Barrett until January, 1948. His widow and one son survive.

William C. Bainbridge

William C. Bainbridge, associated with H. Kohnstamm & Co., Inc., New York 7, N. Y., since 1906, died on July 5 at his home in Brooklyn, N. Y. He was 66 years old. Mr. Bainbridge was recognized as one of the developers of certified food colors. He was graduated from Brooklyn Polytechnic Institute, where he later served as an instructor in chemical engineering. Mr. Bainbridge was the author of many scientific works, and a member of many scientific and fraternal organizations. His wife and daughter survive.

Paige B. L'Hommedieu

Paige B. L'Hommedieu, a retired executive of Johnson & Johnson, New Brunswick, N. J., died on July 4 at his home in Piscataway Township, N. J. He was 74 years old. Previous to his association with Johnson & Johnson, Mr. L'Hommedieu had been associated with the U. S. Rubber Co. Born in Cuyahoga Falls, Ohio, he was a charter member of the New Brunswick Rotary Club and a member of the Sons of the American Revolution. His wife and two sons survive.

Marvin Sherman

Marvin Sherman, general sales manager of the Youngs Rubber Corp., Trenton 9, N. J., died in Groton, Conn., on July 20. He was 55 years old. Mr. Sherman joined the Youngs organization 18 years ago as a salesman and became general sales manager in 1947. His wife, a son and a daughter survive.

James Fairbairn

James Fairbairn, formerly chairman of the council of the Rubber Growers Association in England and one of the pioneers of the rubber cultivation industry in the Dutch East Indies, died at his home in London on June 7 at the age of 77. Born in Edinburgh, Mr. Fairbairn was educated at the Royal High School. He occupied many high positions in the rubber world at one time or another, including the vice-chairmanship of the United Serdang Rubber Plantations, Ltd., and a member of the board of directors of both Rubber Roadways, Ltd., and Deli Estates Engineering and General Union, Ltd. He was also a director of the British Rubber Development Board, serving for a time as chairman. Mr. Fairbairn was a generous patron of many charitable organizations. His second wife survives.

Dr. Otto A. Beeck

Dr. Otto August Beeck, associate director of research for the Shell Development Co. at Emeryville, Calif., died on July 5 in the family car as his wife was driving him to a physician's office. He was 45 years old. Born in Stettin, Germany, Dr. Beeck joined Shell in 1933, after teaching at the California Institute of Technology. Before that, he taught at the Danzig Institute of Technology where he received his degrees in engineering and physics. In recent years, Dr. Beeck had lectured at Western Reserve University and Ohio State University. He also served as associate editor of "The Journal of Applied Physics," and advisory councillor for the American Institute of Physics. His widow, Kisa Beeck, is a well-known sculptor.

Bertrand J. Yeaton

Bertrand J. Yeaton, assistant to the treasurer of the Anaconda Wire & Cable Co., New York 4, N. Y., died of a heart ailment on August 1, at the Sunnyside Hospital, West New Brighton, S. I., N. Y. He was 59 years old. Born in Peoria, Ill., Mr. Yeaton began his career with the Aluminum Co. of America and later became plant manager of the American Brass foundry at Hastings-on-the-Hudson, N. Y. He also was former treasurer of the General Motors overseas agency in Japan. He leaves his wife and son.

George E. Whitelam

George Edward Whitelam, former vice-president of the old Fisk Rubber Corporation of Chicopee Falls, Mass., died in Orlando, Florida, on June 27 at the age of 69. He and Mrs. Whitelam had lived in Orlando since his retirement in 1940.

DuPont Rulan Plastic Insulation

Rulan, a high quality plastic electrical insulation which will not support combustion, has been developed by the Polychemicals Department of E. I. du Pont de Nemours & Co. Inc., Wilmington 98, Del. The product is now available in commercial quantities and is being offered to the wire and cable industries. Its electrical properties are comparable to, though not the equivalent of polyethylene. Rulan has a power factor, over a wide range of frequencies, of 0.002, as compared with 0.0002 for polyethylene. Its dielectric constant of 2.7 compares with that of less than 2.5 for polyethylene. The new plastic insulation is non-tracking and retains its electrical properties after immersion in water for long periods at elevated temperatures. Its low temperature properties may be classified as excellent and its mechanical properties as good. Rulan plastic may be extruded on to wire at high speeds and may also be injection molded.

Zinc Oxide Output Increased

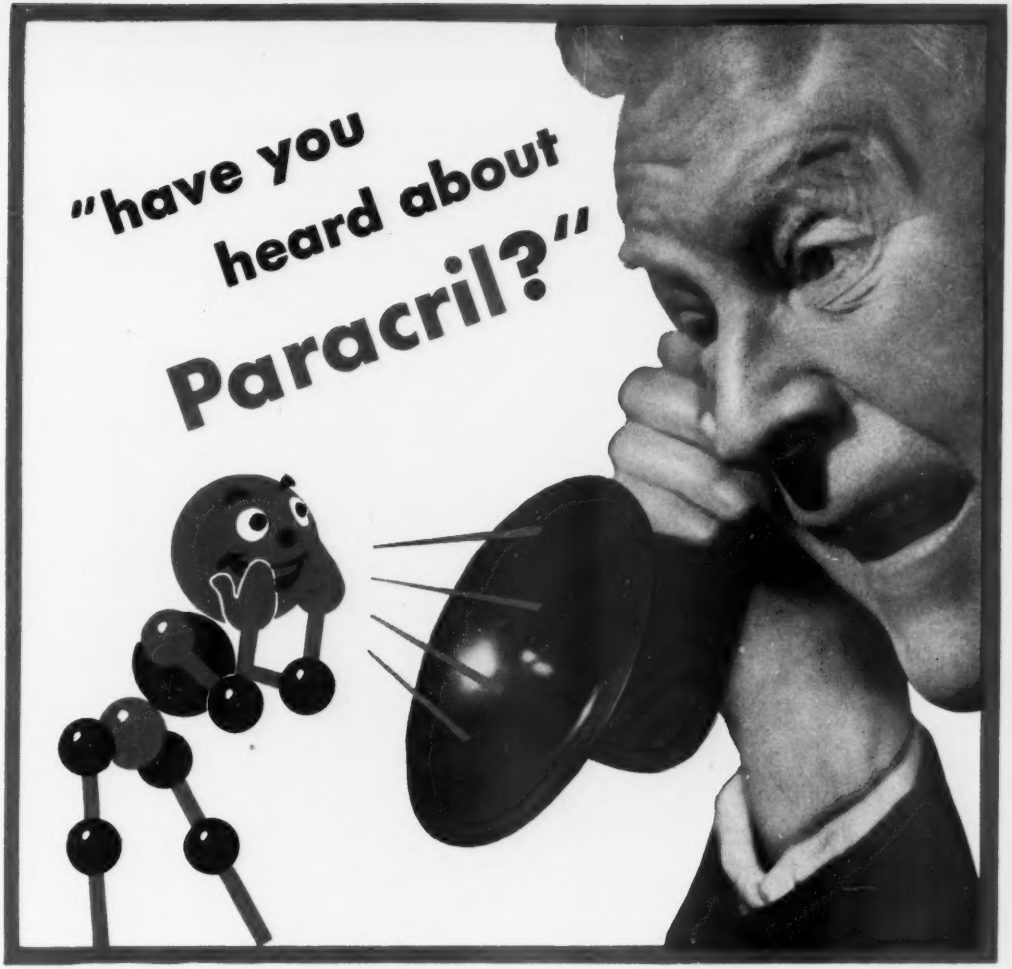
Production of zinc oxide in May totaled 19,688 tons, an increase of 7 per cent above April output, according to the Bureau of Mines, U. S. Department of the Interior. Stocks of zinc oxide on May 31—highest since September, 1949—were 15,743 tons compared with 15,644 tons on April 30. Production of lead-free zinc oxide rose 7 per cent to 14,352 tons. Leaded zinc oxide output totaled 5,336 tons, an 8 per cent gain over April and the highest production since March, 1948, when the total was 7,005 tons. A 14 per cent increase in oxide shipments in May brought the total to 19,589 tons, the highest monthly level since August, 1948. Sales of lead-free oxide were 14,442 tons and of leaded zinc oxide 5,147 tons compared with 13,836 tons of lead-free oxide and 6,374 tons of leaded zinc oxide sold in August, 1948.

Harry P. Bowra

Harry P. Bowra, for many years a representative of Fritzsche Brothers of Canada, Ltd., and since October, 1948, manager of the Boston, Mass. office of Fritzsche Brothers, Inc., New York 11, N. Y., passed away on June 26 at the Peter Pent Brigham Hospital in Boston. Mr. Bowra was 38 years old. Services and interment were in Paterson, N. J. He is survived by his wife and mother.

Charles A. Thomas

Charles A. Thomas, retired vice-president and secretary of the S. S. White Dental Manufacturing Co., Philadelphia 5, Penna., died on July 5 at his home in nearby Bywood. He was 56 years old. Mr. Thomas was a member of the United States Chamber of Commerce, the National Association of Manufacturers and the Union League. His wife and two sons survive.



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When Compounding	Advance Vistac #1
RECLAIM	improves processing
GR S	imparts flex-life, color retention & processing ease
GR I	provides splicing tack
HEVEA	permits increased loading; betters flex-life

★ Pressure-sensitive adhesives are produced consistently and economically with Advance Vistac #1.

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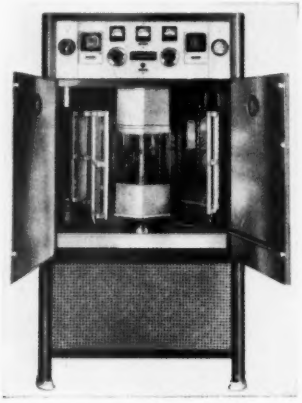
NEW EQUIPMENT

Atlas Type XW Weather-Ometer

A new Weather-Ometer, called the Type XW, has been introduced by the Atlas Electric Devices Co., 361 West Superior St., Chicago 10, Ill. According to the company, the Type XW is a completely redesigned and modernized version of the Model X-1-A into which have



been incorporated many new features employed for the first time in any weathering machine as well as many features that have made the company's Twin Arc Weather-Ometer so well-known for automatic control of test conditions.

The source of radiation in the Type XW is a Sunshine Carbon Arc of the open-flame, motor-driven type whose radiation at the specimens very closely approximates natural sunlight both as to intensity and spectral distribution. The arc, accommodating three pairs of carbon electrodes, automatically shifts from one pair to another as the carbons are consumed, thus providing for a continuous burning time of 16 to 18 hours per trim of carbons. The Corex D. filter panes are mounted in a new, more convenient type holder designed to eliminate the possibility of unfiltered radiation reaching the specimens. The lamp is mounted in a fixed position and is rotated through 180°, providing easy access to all parts of the lamp for retrimming and servicing and thus eliminating all overhead arches, cables, pulleys and counterweights. After trimming, the arc will operate continuously without attention until the carbons are consumed, at which time a limit switch automatically shuts down the entire machine.

Specimen temperatures, over a wide range, are automatically maintained throughout the test at the value selected by the operator. This is accomplished by rotating the specimens around the constant light source at a fixed distance, and by uniformly removing excess heat from all specimens by assuring a constant volume of air at a constant temperature. The constant volume of air is provided by a blower unit which is in continuous operation. Constant temperature of air is maintained by a system of ducts and an air mixing valve at the point where air enters the insulated chamber. The air mixing

foam rubber lasts longer...

with the new non-staining, non-discoloring

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Give longer life to foam rubber with Calco's new ANTIOXIDANT 2246, the most active, non-staining, non-discoloring antioxidant ever developed.

A white crystalline powder, ANTIOXIDANT 2246 shows the lowest net cost for equivalent or better aging qualities than any other product of this classification now on the market. It gives excellent results in white or light-colored rubber products.

Write for the Technical Bulletin on ANTIOXIDANT 2246.

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INTERMEDIATE & RUBBER CHEMICALS DEPARTMENT
BOUND BROOK, NEW JERSEY, U.S.A.

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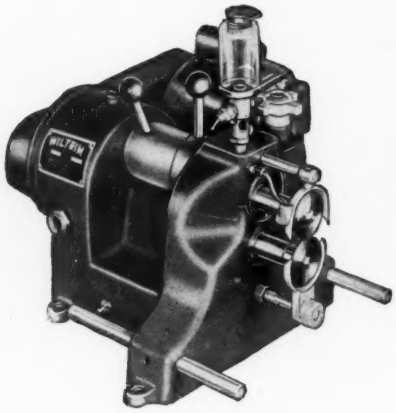
valve is driven by a modulating motor actuated by the thermostat; this arrangement automatically proportions and mixes the proper amounts of warm air from the test chamber and cooler air from the room thus eliminating variations due to room temperature.

The conveniently located control panel of the Type XW contains all control and indicating instruments, including an ammeter and voltmeter, voltage adjusting switch, voltmeter switch and arc current regulating mechanism. The actual number of hours of arc operation are indicated on a running time meter, while a cycle meter automatically controls the interval and duration of the periods of light only, light with spray and spray only. A time switch enables the operator to set the machine for automatic shut-down for any predetermined time between 1 to 24 hours.

The capacity of the Type XW model is 54 specimens —each measuring 3 by 9 inches. According to Atlas, the Type XW will meet all specifications calling for the Model X-1-A weathering unit.

Wiltrim Model DF Trimmer

A new high-speed, heavy-duty, rotary knife trimmer has been developed by the Wills Rubber Trimming Division of Ferry Machine Co., Kent, Ohio. Called the Wiltrim Model DF-100, it is said to be an outstanding new design which embodies the best features of the earlier Models D, DE and DM plus new improvements.



The new unit is ruggedly constructed of steel and cast iron, has solid one-piece shafts, is ball bearing equipped, and is grease sealed for life. Gears are scissor mounted, maintaining constant mesh, and are run in an oil bath. The lap and tension adjustment is fast, accurate and positive, and may be made without the use of tools. Knives are the standard 2½-inch size. Selective cutting speeds up to 1725 rpm are featured. The new Wiltrim Model DF-100 is available with attachments for circular trimming, flat work trimming or items with double and single flash.

Now . . . Measure Latex Flow without Seal Pots!

You get rid of seal pot difficulties, once and for all, when you measure the flow of latex or similarly troublesome fluids with the Foxboro d/p Cell! By installing this unique differential pressure transmitter, one leading rubber manufacturer realized an *83% reduction* in instrument cleaning and maintenance costs. This saving, alone, will repay the cost of his d/p Cell installation within the first year! In addition, production losses due to downtime for instrument maintenance are practically eliminated.

The reason why the d/p Cell needs no seal pots is the essentially-zero displacement of its measuring element. Other features: uses no mercury; compact and easy to install; Type 316 S.S. construction. Thousands in use on all types of fluids!

Write for detailed Bulletin 420 describing the revolutionary d/p Cell! **The Foxboro Company, 256 Neponset Ave., Foxboro, Mass., U.S.A.**

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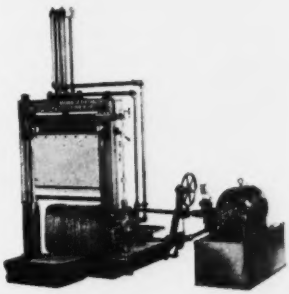
It's advantages like these that make the "Black Rock" 4-KBW HYDRAULIC CRUDE RUBBER CUTTER the machine to use for cutting baled crude rubber, wax, scrap tires, scrap friction stock, rag rope and all materials which can not be cut by ordinary means.



- Fast—efficient—self contained.
- No lubricants needed for cutting.
- Automatic blade return.
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- Knife opening 30" x 20".
- Size 42½ x 83.
- Height 97".

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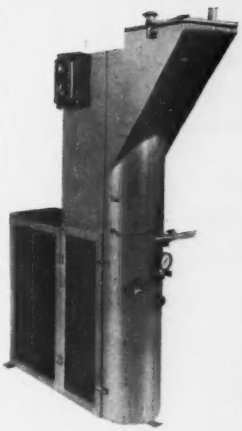

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You Can Get a *Cleaner* Dusting Job

A Campbell Soapstoner gives you a *cleaner* dusting operation, which means *better* working conditions and *more* production.

It's air-tight, dust-proof and a streamlined space saver. A dust-proof bag loader is extra equipment, available if you wish. The Campbell Soapstoner supplies its own air—you don't have to use factory air lines which are often moisture-laden.

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they are used to modify the degree of tackiness desired in the dry cement film.

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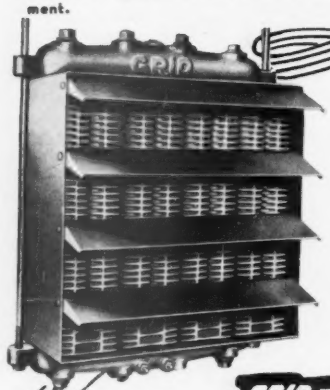
TO GO THROUGH MANY HEATING SEASONS WITHOUT UNIT HEATER MAINTENANCE EXPENSE, providing yours is a GRID installation? It's possible, and being done by major rubber plants who have investigated and installed GRID equipment.



It's possible because:

GRID cast iron construction withstands corrosive fumes.

GRID wide fin spacing facilitates easy cleaning.

GRID will withstand steam pressures up to 250 lbs., and is free of electrolysis.

GRID fins are cast integral with the steam chamber assuring even distribution of heat. It's not possible for GRID fins to come loose from the steam chamber to cause loss of heating efficiency.

GRID design incorporating proper fan sizes, motor speeds and outlet temperatures results in a properly balanced heating unit, especially when high steam pressures are used.

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For outside air, drying, process work, GRID Blast Coils have the same high efficiency as GRID Unit Heaters . . . no tortuous air passages . . . freedom of expansion with complete absence of ruptures, strains, or warping . . . open design for easy cleaning . . . not affected by atmospheric conditions.

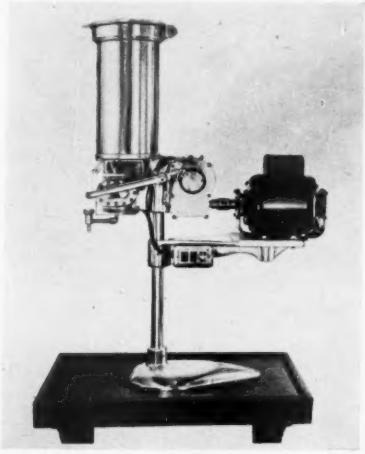
WRITE today for a complete GRID story on maintenance-free heating equipment for your plant.

Investigate today GRID systems of high pressure unit heaters, blast coils, and radiation . . . the answer to maintenance-free heating in the rubber industry.

D. J. MURRAY MANUFACTURING CO. WAUSAU WISCONSIN

Robinson Metering Pump

A new metering pump expressly designed for use with latex or rubber solutions has recently been developed by Edward E. Robinson, Inc., 95 Park Ave., Nutley 10, N.J. It is a thermostatically controlled gear type pump which forcibly ejects predetermined uniform amounts of latex or solutions, single ejections ranging from the



barest minimum up to two full gallons. The highest discharge rate of the unit is 88 ejections per minute with an accuracy of plus or minus 3%. The amount to be metered is pre-set in a matter of seconds to any of 20 different settings. No tools or particular skills are required in changing settings. The pump can be equipped with an explosion-proof motor so that solvent operations can be handled without hazard. Highly viscous compounds can be handled without heating. The unit, illustrated herewith, carries its own storage tank, but can be connected directly to large-size storage tanks if desired. Automatic timing mechanisms can be readily attached and production is recorded by a counter which is standard equipment.

...non-staining?

SEE PAGE 510

SIZE? THICKNESS? COMPRESSIBILITY?

Get the Answers with FEDERAL GAGES

BENCH-TYPE, MODEL 57-B1
Graduated .001", range 1.000", Throat depth 2 7/16".

PORTABLE, MODEL 22P
Graduated .001", range .500", Throat depth 2".

Federal Bench-Type and Portable Gages are designed to meet the specific measuring requirements of your industry. They're built rugged to withstand day-by-day handling. Furnished, if required, with weights and anvil diameters to meet society standards. Many other types available. Write for catalog. Federal Products Corp., 1102 Eddy St., Providence 1, R. I.

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Reduce Accidents Like This With the New THROPP HYDRAULIC BRAKE

You will find that the new Thropp Hydraulic Brake will stop the travel of in-running rolls almost instantly.

They can be applied to any existing mill or calender in your plant. We will be glad to send you complete installation data on request.

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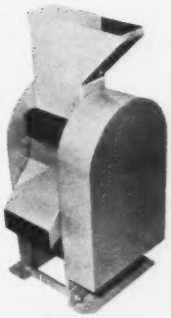
a NEW FOREMOST waste cutter

This latest FOREMOST cutter features the *exclusive* twin-knife arrangement that cuts waste without tearing and permits equally efficient cutting of warm or cold stocks. Powered with a 1 hp motor, and with a capacity up to 150 pounds per hour, this model can be used to cut . . .

Foam Rubber
Sponge Rubber
Rubber Thread
Rubber
Plastics
Cork
Paper
Leather



Other Features:
—Belt Driven
—Air Cooled
—Cuts Down to 1/8" Mesh
—Uniform Size Particles
—Practically Dust-Free Operation
—Requires Area Only 1' x 1½'
—Economical

Suitable for laboratory use or actual production, where it can be mounted beside a press or injection molding machine for cutting sprues, gates, runners, and overflow for immediate re-use.

FOREMOST makes a complete line of gyratory screens, waste cutting and grinding equipment. Our engineering department welcomes your inquiries on anything from a single machine to a complete waste material grinding system.

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FOREMOST MACHINE BUILDERS, INC.

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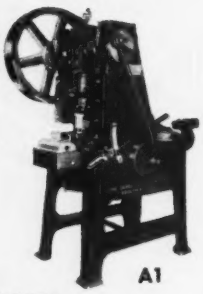
For MORE than Half a Century the name COULTER has meant MORE in higher quality cuttings . . . MORE IN GREATER PRODUCTION. So much MORE that . . .

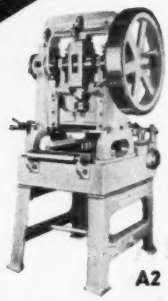


A1

Men who Know PRODUCTION MACHINES Choose

the James COULTER Machine Co.
BRIDGEPORT, CONN.

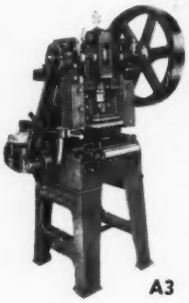
MODEL A-1
Cutting Heels at high speed production or short runs.



A2

MODEL A-2
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-3
Cutting Multiple Heels and Taps with or across stock grain.



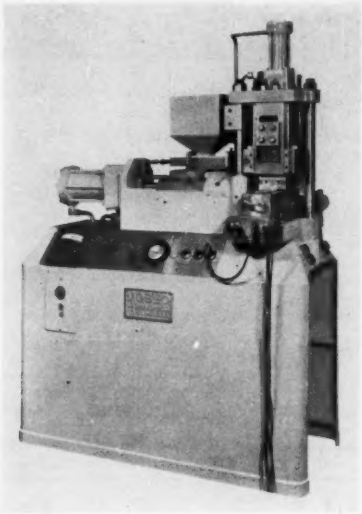
A3

MODEL A-2s
(Not illustrated)
Cutting across grain of stock.

COULTER PRODUCTION MACHINES SINCE 1896

Duplimatic Injection Molder

Differing from ordinary molders in employing a two-sided, self-positioning lower mold section, the Duplimatic Injection Molder produced by the Moslo Machinery Co., 2443 Prospect Ave., Cleveland 15, Ohio, is so designed that one half of the mold can be cleared and reloaded while the other half is engaged in the molding



cycle. The lower mold section, twice the size of the upper, has a complete duplicate set of cavities, and is mounted on an automatic positioning bed.

In starting, one half of the lower mold section is exposed to ready access by the operator. The injection and clamping head has a compact vertical cross-section which allows generous clearance at each side. This makes it possible to quickly and carefully load the insert parts in the idle set of cavities. Inserts can be locked securely, for accurate alignment, and to prevent dislocation that might damage the mold.

As soon as all inserts are placed and locked, the operator presses two control buttons, which shift the mold and set the automatic cycle in action. The mold can never be closed unless both hands are in the safety position. Hydraulic action moves the lower section into position, the loaded cavities accurately aligned with the upper section. The mold is closed; an injection charge, carefully metered, is shot and timed. The timing, pressure and quantity of plastic in the charge are all accurately adjustable through easily accessible controls.

Production of a new, improved **Speed Control Valve** for use on pneumatic cylinders has been announced by the Hannifin Corp., Chicago 24, Ill. The new valve employs a guided poppet of ample diameter to allow full, pipe-size flow toward the cylinder. It provides metered flow away from the cylinder by means of a large-diameter, tapered valve stem which is threaded to permit sensitive adjustment from 0 cfm to maximum capacity.

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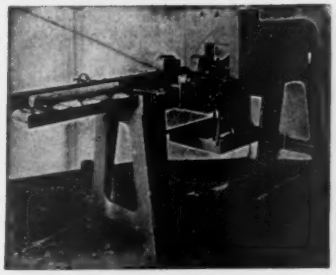

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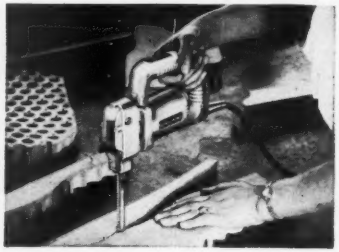
. . . cuts up to 4" thick at speeds up to 30 ft. a minute!



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No. 99 Sponge Rubber Cutter operates on either A.C. or D.C. Blades are made of alloy steel for long life and are easily replaceable.

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REVIEWS

BOOKS

Advances in Colloid Science: Vol. III. Edited by H. Mark and E. J. W. Verwey. Published by Interscience Publishers, Inc, 215 Fourth Ave., New York 3, N. Y. 6 x 9 in. 384 pp. $7.50.

This is the third in a series of volumes intended to provide a medium in which recent significant discoveries or advances in colloid science, either experimental or theoretical, would be presented in a comprehensive and unified fashion. Several of these developments were covered in the first volume issued in 1942 (see RUBBER AGE, Feb., 1942, p 384). The second volume, issued in 1946 (see RUBBER AGE, May, 1946, p. 220), was devoted to a field of special and actual interest at that time, i.e., the analysis and characterization of the rubbery state, the volume being subtitled "Scientific Progress in the Field of Rubber and Synthetic Elastomers." This third volume covers a series of topics and gives an approximate cross-section through those branches of colloid science that have grown rapidly or shown unexpected developments during the last few years. A fourth volume is in preparation.

The current work covers seven specific subjects, each prepared by experts in the field and complete with bibliographies. These subjects and their authors are: (1) Atomic Forces and Adsorption, by J. H. De Boer; (2) Surface Chemistry and Colloids, by A. E. Alexander; (3) Quantitative Interpretation of the Electrophoretic Velocity of Colloids, by J. Th. G. Overbeek; (4) Lyogels, by E. A. Hauser; (5) Ultracentrifugal Sedimentation of Polymolecular Substances, by Per-Olof Kinell and Bengt G. Ranby; (6) Fatigue Phenomena in High Polymers, by J. H. Dillon; (7) Flotation, by Strathmore R. B. Cooke. A subject index is included.

•

Standards on Rubber Products: 1950. Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penna. 6 x 9 in. 652 pp. $4.75.

This latest edition of A.S.T.M. standards, issued through the work of Committee D-11 on Rubber and Rubberlike Products, includes all of the standard and tentative test methods and specifications pertaining to rubber products. An idea of the coverage of the rubber standards can be secured from the following list, the number of standards applicable being indicated in the parentheses: Processibility Tests (3), Chemical Tests of Vulcanized Rubber (4), Physical Tests of Vulcanized Rubber (21), Aging and Weathering Tests (8), Low Temperature Tests (5), Automotive and Aeronautical Rubber (7), Hose and Belting (5), Tape (3), Electrical Protective Equipment (6), Rubber-Coated Fabrics (3), Insulated Wire and Cable (13), Hard Rubber (3), Latex Foam, Sponge and Expanded Cellular Rubber (2), Rubber Cements (2), Rubber Latices (2), Packing Materials (2), Non-Rigid Plastics (10), Electrical Tests (4), Nomenclature and Definitions (4). Many of the specifications and tests included have been reviewed recently by the society.

•

Standards on Electrical Insulating Materials: 1950. Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penna. 6 x 9 in. 670 pp. $4.85.

Compiled by A.S.T.M. Committee D-9, this book includes all of the standard and tentative test methods and specifications pertaining to electrical insulating materials. Included are 16 standards for insulating fabrics and textile materials, 8 on rubber tape and electrical protective equipment, 5 on plastics, 11 on mineral oils, 6 on insulating shellac and varnish, 2 on solid filling and treating compounds, and 5 on insulating papers. Many of the specifications and tests have been revised recently by the society.

Physical Chemistry of High Polymeric Systems. (Second Edition). By H. Mark and A. V. Tobolsky. Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y. 6 x 9 in. 506 pp. $6.50.

So much progress has been made in most branches of polymer science since publication of the first edition of this work in 1940 (see RUBBER AGE, Dec., 1940, p. 198), that the authors deemed it advisable to expand and amend the text. Some indication as to how much progress has been made in the interim is given by the fact that this new edition, which has been completely revised, is augmented by an additional 150 pages, 56 figures, and 13 tables. Like the first edition, the current work presents a condensed selection of the basic facts of the physical chemistry of macromolecules. The chapters on molecular structure are followed by a treatment of the present concept of intra-and intermolecular forces. Since the thermodynamic and kinematic behavior of polymer solutions and the mechanical properties of polymers have come under intensive investigation in the past ten years, the chapters on these subjects include far more detailed information than the corresponding chapters in the first edition. The book has 13 chapters in all and includes both author and subject indexes.

•

Classified Directory of Wisconsin Manufacturers: 1950-51. Published by the Wisconsin Manufacturers' Association, 633 North Water St., Milwaukee 2, Wisc. 6 x 9 in. 800 pp. $10.00.

The latest edition of this directory provides accurate information on more than 4,500 Wisconsin firms engaged in every conceivable type of industry. The current edition is divided into five major sections, including an alphabetical list of manufacturers, a geographical list of manufacturers, a products index section, an index of brands made in Wisconsin, and a list of Wisconsin canneries. It is the tenth edition to be issued since publication of the directory was begun in 1921 and is said to be the most complete edition compiled to date.

•

Solid Fatty Acids. Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio. 8½ x 11 in. 12 pp.

Complete information on specifications, characteristics such as stability, composition, quality, uniformity and their effect on finished products utilizing fatty acids is included in this bulletin. Other factors such as processing methods and packaging are also covered by the comprehensive report. The bulletin is illustrated with photographs, charts, graphs and drawings.

SEE PAGE 510

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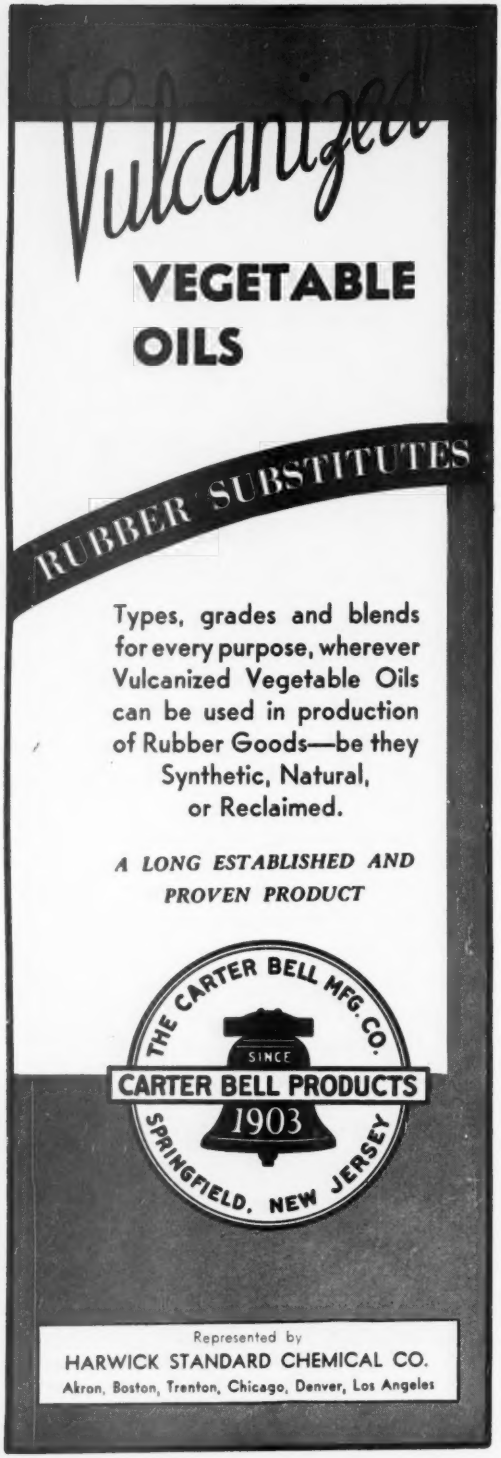
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Handbook of Material Handling with Industrial Trucks. Electric Industrial Truck Association, 3701 N. Broad St., Philadelphia 40, Penna. 8½ x 11 in. 72 pp. $1.00.

Divided into four sections, this handbook contains: (1) The Evaluation of Industrial Truck Handling; (2) Material Handling Management, with sub-sections devoted to the preparation and use of flow process charts, handling operations in production, handling in storage, the use of unit loads in storage, with layouts, commodity and capacity factors, etc.; (3) The Organization of an Industrial Truck System and (4) Practical Truck Engineering. Sections of the handbook describe the different types of industrial trucks in use, their integration of operation with other material handling systems; unit load determinations and patterns; how to charge and how to change storage batteries; how to keep battery records; how to measure handling costs; routing and dispatching methods, and how to train industrial truck operators. Different types of skids, pallets and other load carriers are illustrated and described. The handbook also contains pictures showing actual applications of industrial trucks in handling and storage operations in the rubber and other industries.

•

Rubber in Aircraft. By T. L. Garner and J. F. Powell. Published by the British Rubber Development Board, Market Buildings, Mark Lane, London, E. C. 3, England. 5½ x 8½ in. 72 pp.

This is one of the most comprehensive treatises on the numerous applications of rubber in aircraft which has yet been compiled. It contains ten chapters, as follows: (1) Rubber as an Engineering Material; (2) Rubber Processing; (3) Airplane Tires; (4) De-Icing Equipment; (5) Hydraulic Applications and Oil Seals; (6) Insulation Suspension; (7) Hose and Tubing; (8) Fuel Tanks; (9) Miscellaneous Uses; (10) Conclusion. The booklet contains numerous photographs and schematic drawings, and also includes a list of suggested references for further reading. Its value is enhanced by the inclusion of a subject index. Copies are available without cost on written request to the British Rubber Development Board.

•

Rating Employee and Supervisory Performance. American Management Association, 330 West 42nd St., New York 18, N. Y. 5½ x 8½ in. 192 pp. $3.75.

How to rate subordinates and how to evaluate other men's ratings of those they supervise are explained in this manual of merit-rating techniques. Principles and procedures detailed in the manual apply to a wide variety of industrial, white collar and professional employees in both large and small companies. The guide is designed to increase the effectiveness of present rating systems, and can be used as a blueprint for redesigning a program or for setting up an entirely new one. Fourteen authorities are represented in this manual which draws from the best material so far published by the AMA on the subject. A specially prepared section reproduces 26 selected merit-rating forms in current use in business and industry, and analyzes the various approaches generally utilized in evaluating personnel.

•

Thermolator for Mold Temperature Control. Industrial Mfg. Corp., 31 East Georgia St., Indianapolis, Ind. 8½ x 11 in. 8 pp.

Designed features of the Thermolator, a temperature control instrument intended for use in the thermoplastic molding field, are outlined in this booklet. The principles involved in the control of heat are explained. The booklet also offers suggested methods for keeping records of mold temperatures. Photographs provide several views of the Thermolator.

Robinson Mixers. (Catalog No. 32F). Mercer-Robinson Co., Inc., 30 Church St., New York 7, N. Y. 8½ x 11 in. 24 pp.

The company's lines of horizontal mixers or blenders, brush sifters, and vertical liquid and semi-mass mixers are illustrated and described in this catalog. Specifications are offered for each of the units discussed, including capacities, horsepower requirements, shipping weight, speed agitator, height and depth along edge, etc. Among the specific units discussed are horizontal batch mixers, heavy duty mixers with belt or motor drives, trowel type mixers, straight brush sifters, twin shaft mixers, continuous mixers, prism mixers and vertical liquid types.

•

Photo Electric Amplifiers. (Catalog No. 550). De-Tec-Tronic Laboratories, Inc., 1227 North Clark St., Chicago 10, Ill. 8½ x 11 in. 8 pp.

Thirty-three items of photo-electric equipment and accessories for industrial applications including production control, counting, boiler and ventilating smoke detectors, burglar and warning devices are illustrated and described in this catalog. Specifications are offered for each of the units together with information as to the different uses to which the unit may be put. Other factors discussed for each of the units includes the amplifier, controls, indicators, wiring, operating voltage, size, etc.

•

Falk Speed Reducers. (Engineering Bulletin No. 1105). Falk Corp., Milwaukee 8, Wisc. 8½ x 11 in. 16 pp.

The company's new concentric shaft speed reducer—Type C—is described and illustrated in this bulletin. Horsepower rating tables are offered as are torque capacity tables. Other information provided includes minimum sprocket diameters, maximum overhung loads, weights, oil capacities and dimensions. A special section of the bulletin is devoted to method of selection. Here is explained the manner in which a reducer may be selected by horsepower or by torque. Service factors are also considered in the bulletin which features cutaway drawings, photographs, tables and charts.

•

Tygon Corrosion-Resistant Paint. (Bulletin No. 712). U. S. Stoneware Co., Akron 9, Ohio. 8½ x 11 in. 12 pp.

The chemical resistance characteristics of Tygon Paint are presented in one section of this new bulletin which also itemizes recommended primers and surface treatments. The bulletin offers, in addition, condensed technical data on the paints and other interesting and informative details.

SEE PAGE 510

All dressed up and no place to go?

Our business is proving how wrong that is . . . if your product is "all dressed up" with the right finish, it's bound to go places.. The right finish means greater durability, a more attractive appearance, and greater usefulness — which all adds up to empty dealers' shelves and greater customer satisfaction.

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MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, AUGUST 10, 1950

Natural Rubber

Natural rubber prices continued their spiraling trend since our last report (July 6), with the price of spot rubber reaching a high of 64.50 cents on August 8. The low of the period, 33.75 cents, was reached on July 7, representing a differential of 30.75 cents. The average price of spot rubber for July was 39.10 cents based on 20 trading days. This compares with an average of 30.92 cents for June.

A sharp break in the rising price pattern during the past few days gave rise to speculation that the peak price level had been reached. There is substantial evidence that the squeeze which has existed in nearby rubber is diminishing.

Lately, there have been increased offerings of rubber afloat. It is also likely that the Government will come to the aid of manufacturers who do not have the necessary raw materials to fill Government orders. There is also the probability that a revised R-1 order will be promulgated restricting the use of natural.

The margin requirements for rubber on the New York Commodity Exchange were raised twice during the period, on July 27 and on August 7. Margin requirements on regular rubber futures were raised from $1,500 to $2,500 to $5,000. On hedging operations, margins were increased from $1,000 to $1,500 on July 27, and increased again to $2,500 on August 7. Straddle operations were advanced from $400 to $700 and last to $1,200.

Today's quotations on the outside market, London and Singapore, follow:

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.44
August	.44
September	.41½
Thin Latex Crepe:	
Spot	.46
September	.45
Thin Brown Crepe, No. 2	.38½
Ambers, No. 3	.48½
Flat Bark Crepe	.36

London Market
(Standard Smoked Sheets)

September	—— - 49.00
October-December	42.29 - 42.58

Singapore Market
(Standard Smoked Sheets)

September	40.03 - 40.36

Synthetic Rubber
(Dry Types-Per Pound)

Butaprene NF	.440 - .450
Butaprene NL	.450 - .460
Butaprene NAA	.490 - .500
Butaprene NXM	.520 - .530
Chemigum 30 N4NS	.400 - .470
Chemigum 50N4NS	.400 - .470
Chemigum N3	.450 - .520
GR-I	—— - .185
GR-S	—— - .185
Hycar OR-25	.450 - .460
Hycar OR-15	.520 - .530
Hycar OS-10	.500 - .510
Neoprene Types CG and AC	—— - .500
Neoprene Type E	—— - .650
Neoprene Types FR and KNR	—— - .750
Neoprene Type GN	—— - .350
Neoprene Type GN-A	—— - .350
Neoprene Type RT	—— - .370
Neoprene Type S	—— - .350
Neoprene Type W	—— - .370
Paracril 18	.430 - .450
Paracril 26	.440 - .460
Paracril 35	.510 - .530
Silastic (compounded)	2.35 - 4.40
Thiokol Type A	.370 - .470
Thiokol Type FA	.520 - .620
Thiokol PR-1	.750 - .850
Thiokol Type ST	.750 - .850

Scrap Rubber

The sustained increase in demand for reclaim due to the shortage of GR-S and the high price of natural rubber has served to stimulate the market for scrap rubber to new high levels. Increases in demand have been noted for all grades, with the result that several types of scrap are momentarily in short supply. In accordance with these conditions, prices for scrap rubber have again been revised upwards. Current quotations follow:

Mixed passenger tires	ton	$30.00
Beadless truck tires	ton	nom.
Mixed truck tires	ton	30.00
Beadless passenger tires	ton	nom.
No. 1 passenger peelings	ton	60.00
No. 1 truck peelings	ton	60.00
Red passenger tubes	lb.	.10
Black passenger tubes	lb.	.08
Mixed passenger tubes	lb.	.06
No. 2 truck tubes	lb.	nom.
Red truck tubes	lb.	.10
Black truck tubes	lb.	.08
Buffings	ton	20.00

Reclaimed Rubber

Consumption of reclaim for the month of June was estimated at 25,244 long tons by the Department of Commerce, compared with the 24,158 long tons consumed in the previous month. Consumption of reclaimed rubber continues at top levels. Scarcities have developed in the raw material for certain types of reclaim, such as light-colored grades and inner tube reclaims causing these types to advance in price. Prices for tire types, however, have not advanced during this past period. Current quotations follow:

Tires

Black, Digester (Natural)	lb.	.09 - .09½
Peels No. 1	lb.	.09½ - .10
Whole Tire (Blend)	lb.	.08¾ - .09¼

Inner Tubes

Black (Natural)	lb.	.15 - .16½
Red (Natural)	lb.	.17½ - .18
Butyl	lb.	.10½ - .11

Shoe

Unwashed (Natural)	lb.	.08¾ - .09¼

Cotton Tire Fabrics

The demand for cotton tire fabrics has continued at a high level throughout this period. As in past months, the shortage of synthetic fibers and the high production of tires have combined to accelerate market conditions. Trade circles are of the opinion that while the market may taper off to some extent, the general level of business activity will be good. Prices remain at substantially the same levels. Current quotations follow:

Standard, Peeler, 12/4/2	lb.	.68½
Standard, Peeler, 14/4/2	lb.	.70½
Standard, Peeler, 16/4/3	lb.	.73
Extra Staple, Peeler, 12/4/2	lb.	.84
Extra Staple, Peeler, 14/4/2	lb.	.86
Extra Staple, Peeler, 16/4/3	lb.	.89

Chafers

14.4 oz. (per sq. yard)	lb.	.67½
9.25 oz. (per sq. yard)	lb.	.64
11.65 oz. (per sq. yard)	lb.	.61
8.9 oz. (per sq. yard)	lb.	.65½

Cotton

The market for middling ⅞ uplands on the Cotton Exchange has moved in a range of 4.75 cents since our last report (July 6), high for the period being 39.95 cents reached on July 27, and low being 35.20 cents reached on July 7. The average price of middling uplands for the month of July was 38.11 cents based on 20 trading days. This compares with an average of 34.61 cents in the previous month.

The Agriculture Department forecast on August 8, that this year's cotton crop will be about 30% smaller than the current rate of consumption. But reserves from past crops were said to be ample to meet needs until next year's crop is harvested. In its first estimate of the year, the Department put the prospective crop at 10,308,000 bales. This is 5,820,000 bales, or 36%, less than last year's production of 16,128,000 bales and 11% less than the 1939-48 average of 11,559,000 bales. Contributing to the relatively small crop were the Government production control program, weather conditions and insect damage.

The crop will be supplemented by reserves of about 7,000,000 bales from previous crops to give a total supply in excess of expected needs. Domestic consumption and exports during the 1949 crop marketing year, which ended July 31, totaled about 14,500,000 bales. If need be, the Government could reduce exports by making less foreign aid money available to Western Europe for purchase of American cotton.

Quotations for middling uplands on the Exchange follow:

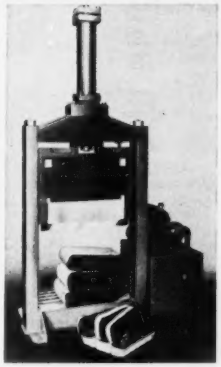
	July 6	August 10		
	Close	High	Low	Close
Oct.	33.31	38.35	37.90	38.01
Dec.	33.24	38.38	38.05	38.13
Mar.	33.33	38.39	38.05	38.14

Closing Rubber Prices on New York Commodity Exchange
(No. 1 R.S.S. Contract)

FROM JULY 7 TO AUGUST 10

July	Spot	Sept.	Dec.	Mar.	May	Sales
7	33.75	30.95	28.55	27.00	26.20	138
8	——	——	——	——	——	——
9	——	——	——	——	——	——
10	34.75	30.60	28.30	26.75	25.95	121
11	34.50	31.70	29.30	27.50	25.95	236
12	35.75	31.40	28.90	27.25	25.70	182
13	35.50	32.15	29.25	27.65	26.10	183
14	36.50	31.90	28.75	27.00	22.50	200
15	——	——	——	——	——	——
16	——	——	——	——	——	——
17	36.50	33.85	30.70	28.25	26.75	235
18	38.50	32.90	29.80	27.55	26.05	299
19	38.00	33.40	30.40	28.15	26.65	160
20	39.00	34.90	31.90	29.60	28.10	204
21	40.50	35.75	32.50	30.35	28.85	229
22	——	——	——	——	——	——
23	——	——	——	——	——	——
24	41.25	37.60	33.60	31.60	30.10	139
25	44.50	39.60	35.60	33.60	32.10	178
26	48.00	40.45	36.00	33.65	32.15	147
27	49.00	42.30	35.00	32.75	30.75	213
28	50.00	44.30	37.00	34.70	32.70	305
29	——	——	——	——	——	——
30	——	——	——	——	——	——
31	52.00	46.30	38.90	35.70	33.70	126
Aug.						
1	51.00	48.30	40.39	35.20	33.20	136
2	52.00	50.30	42.39	36.50	34.50	86
3	54.00	52.30	44.39	38.50	36.50	77
4	59.00	54.30	46.39	40.50	38.50	30
5	——	——	——	——	——	——
6	——	——	——	——	——	——
7	63.00	56.30	48.39	42.50	40.50	33
8	64.50	54.30	46.39	40.50	38.50	169
9	54.50	52.30	44.39	38.90	36.50	99
10	52.50	50.30	42.39	36.90	34.50	——

CRUDE RUBBER BALE CUTTER



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Hydraulic

Operation

High Production

•

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•

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Don't let SCORCHED RUBBER *spoil your day!*

Scorched rubber is a needless waste. Temperature can be controlled when known. Make the use of Cambridge Surface Pyrometers routine procedure in your plant. There are models that are ideal for checking temperature during calendering, mixing, extruding and molding. Each instrument is accurate, rugged and quick-acting, and takes the guesswork out of surface temperature determination.

Combination and single-purpose instruments.

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ROLL • NEEDLE • MOLD
PYROMETERS

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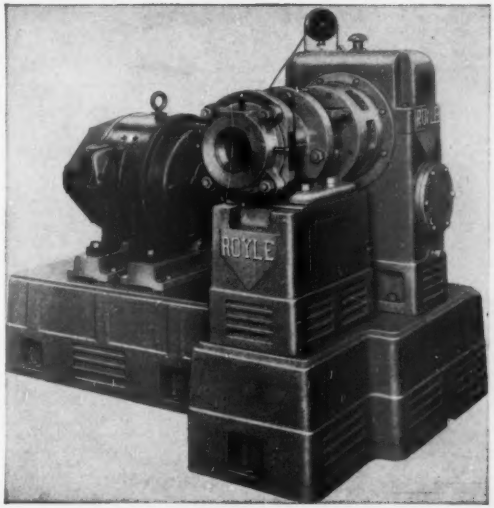
Designed To Extrude RUBBER or PLASTICS

IN these days of rapidly changing developments owners of Royle extruding machines are in the advantageous position of being able to adapt their extruders to either rubber or plastics production. If you are faced with the problem of extruding rubber and plastics the versatility of ROYLE extruders is of paramount importance to you. Whether you require a light or heavy production extruder features have been incorporated to assure maximum results. The change-over is quickly and simply accomplished.

Send for your copy of Bulletin No. 448. It describes these features and how they may be applied to older type extruders.



ROYLE # 2 Extruding Machine. Non-extended cylinder, plain tubing head.

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

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London, England	Home Office	Akron, Ohio	Los Angeles, Cal.
James Day (Machinery) Ltd.	J. W. VanRiper	J. C. Clinefelter	H. M. Royal, Inc.
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CURRENT MARKET PRICES

Of Rubber Chemicals and Compounding Ingredients

AUGUST 7, 1950

Prices are, in general, f.o.b. works. Range of prices indicates grade or quantity variations.

Abbreviations: bbls., barrels; c.l., carlot; cyl., cylinder; dlvd., delivered; dms., drums; l.c.l., less than carlot; M.B., masterbatch; min., minimum; ref., refined; sap., saponified; sp., special; syn., synthetic; t.c., tank cars.

[a] East of Mississippi.

*For Export Only

—The arrangement of this section follows closely the Chemical Section of the 1949 RUBBER RED BOOK to which readers are referred to determine the classification of any material or brand name. —Although suppliers of every material were contacted for price information, only those materials are listed for which quotations have been furnished us. The quotations are not guaranteed and prospective purchasers should contact suppliers for confirmation before placing orders. Suppliers are requested to send us regularly current prices on all of their materials used in the rubber industry.

ACCELERATORS

A-1 (Thiocarbanilide)	lb.	.40	.47
A-32	lb.	.59	.69
A-77	lb.	.42	.55
A-100	lb.	.42	.55
Accelerator No. 8	lb.	—	.98
Accelerator—49	lb.	.44	.45
Accelerator—89	lb.	—	1.20
Accelerator—122	lb.	—	1.30
Accelerator—552	lb.	—	1.80
Accelerator—808	lb.	.59	.61
Accelerator—833	lb.	1.13	1.15
Acro AC-165	lb.	.37	.39
Altax	lb.	.37	.40
Ancap*	lb.	.27	.29
Ancatax*	lb.	.35	.37
Ancazide* ET	lb.	—	1.00
ME	lb.	—	1.10
Ancazate* BU (ET & ME)	lb.	—	1.00
Arazate	lb.	—	2.16
Beutene	lb.	.59	.61
Bismate, Rodform	lb.	—	3.00
Butasan	lb.	—	1.00
Butazate	lb.	—	1.00
Butyl Eight	lb.	1.00	1.25
Captax	lb.	.29	.32
C-P-B	lb.	—	1.95
Cumate, Rodform	lb.	—	1.45
Dibenzo G-M-F	lb.	—	2.50
Diorthotolylguanidine	lb.	.48	.50
Diphenylguanidine	lb.	.39	.45
El-Sixty	lb.	.41	.48
Ethasan	lb.	—	1.00
Ethazate	lb.	—	1.00
Ethex	lb.	—	1.00
Ethyl Thiurad	lb.	—	1.00
Ethyl Tuex	lb.	—	1.00
Ethylac	lb.	.88	.90
G-M-F	lb.	—	2.50
Good-rite Erie	lb.	.31½	.33½
Guantal	lb.	.47	.54
Harvex	lb.	.52	.57
Hepteen	lb.	.42	.44
Base	lb.	1.80	1.85
Ledate, Rodform	lb.	—	1.00
Mercaptobenzothiazole	lb.	.30	.32
Mercaptobenzothiazyl Disulfide	lb.	.38	.40
Mertax	lb.	.40	.47
Methasan	lb.	—	1.00
Methazate	lb.	—	1.00
Monex	lb.	—	1.10
Mono Thiurad	lb.	—	1.10
Morfex	lb.	.56	.58
2-MT	lb.	—	.69
NA-22 (for neoprene)	lb.	—	1.50
Novac	lb.	—	1.40
A-13	lb.	.65	.67
O-X-A-F	lb.	.39	.41
Pentex	lb.	—	1.00
Flour	lb.	—	.20
Permalux (for neoprene)	lb.	—	1.85
Phenex	lb.	.40	.45
Pipazate	lb.	—	1.53
Pip-Pip	lb.	—	1.80
R-2 Crystals	lb.	—	1.75
Rotax	lb.	.42	.44
RZ-50	lb.	—	1.00
SA 52	lb.	—	1.10
SA 57	lb.	—	1.00
SA 62	lb.	—	1.00
SA 66	lb.	—	1.45
SA 67	lb.	—	1.00
SA 77	lb.	—	1.00
Safex	lb.	—	1.15
Santocure	lb.	.58	.65
Selazate	lb.	—	1.45
Selenac (Ethyl, Methyl)	lb.	—	1.45
Setsit-5	lb.	.75	1.00
SPDX-GH (tons)	lb.	.64	
GL	lb.	—	.95
Tellurac	lb.	—	1.45
Tepidone	lb.	—	.55
Tetrone	lb.	—	1.25
A	lb.	—	1.85
Thiolide	lb.	.38	.45
Thionex	lb.	—	1.10
Thiotax	lb.	.30	.37
Thiurad	lb.	—	1.10
Thiuram E	lb.	—	1.00
M	lb.	—	1.10
Trimene	lb.	.54	.56
Base	lb.	1.03	1.06
Tuads, Ethyl	lb.	—	1.00
Tuads, Methyl	lb.	—	1.10
Tuex	lb.	—	1.10
Ultex	lb.	1.00	1.05
Unads	lb.	—	1.10
Ureka Base	lb.	.58	.65
Ureka C	lb.	.63	.70
Vitasan Crystals	lb.	.48	.53
Vulcanex	lb.	—	.33
Z-B-X	lb.	—	2.45
Zenite	lb.	.38	.40
A	lb.	.46	.48
B	lb.	.45	.47
Zenite Special	lb.	.38	.41
Zetax (uncoated)	lb.	.38	.41
Zimate, Butyl	lb.	—	1.00
Zimate, Ethyl	lb.	—	1.00
Zimate, Methyl	lb.	—	1.00

ACTIVATORS

Blue Lead, Sublimed (dlvd.)	lb.	.13¼	.14¼
Fish Oil, Hydrogenated, Fatty Acid			
Hydrofol Acid (dlvd.)	lb.	.13	.17¾
Hyfac 430 (dlvd.)	lb.	.13½	.14¼
Neo-Fat H.F.O. (dlvd.)	lb.	.14½	.15¾
Stearex Beads (dlvd.)	lb.	.12	.13¼
Lime, Hydrated			
Arrowhead	ton	—	20.65
Marblehead	ton	—	14.30
Sierra	ton	—	19.50
Litharge			
Eagle (dlvd.)	lb.	.1375	.1475
FSB (dlvd.)	lb.	—	.1475
Magnesium Oxide, Heavy			
General Magnesite 500	lb.	.05	.06½
600	lb.	.06	.08
Michigan No. 15	lb.	.0550	.0600
Permanente	lb.	.05	.06½
Magnesium Oxide, Light			
Baker's (Neoprene Grade)	lb.	—	.31
General Magnesite (Neoprene Grade)	lb.	—	.30
General Magnesite No. 101	lb.	—	.19
General Magnesite Standard	lb.	—	.22
K & M (Neoprene Grade)	lb.	—	.31
Maglite "M" (l.c.l.)	lb.	—	.31
Marine's (Neoprene Grade (l.c.l.)	lb.	—	.31
Michigan No. 30	lb.	—	.24
No. 40 Extra Light	lb.	—	.31
Witco Extra Light	lb.	.32	.35

ACTIVATORS (Cont'd)

Oleic Acid			
Emersol 210 (dlvd.)	lb.	.16	.17½
L.C.P. Red Oil	lb.	.12¾	.14¼
Red Oil (20-24 Saponified) (dlvd.)	lb.	.12¾	.14½
Palm Oil Fatty Acid (c.l.)	lb.	.11½	.14½
Potassium Oleate (drums)	lb.	—	.29½
Red Lead			
Eagle	lb.	.1475	.1575
No. 2 RM (dlvd.)	lb.	—	.1575
Sodium Laurate (drums)	lb.	—	.19
Sodium Oleate—Powder (drums)	lb.	—	.35
Paste (drums)	lb.	—	.20
Sodium Stearate—Powder (druma)	lb.	—	.35
USP Grade (drums)	lb.	—	.37
Stearic Acid, Single Pressed			
Emersol 110 (dlvd.)	lb.	.15½	.16¾
Groco 53	lb.	.15½	.16¾
Stearex B (dlvd.)	lb.	.15½	.16¾
Stearic Acid, Double Pressed			
Alba (dlvd.)	lb.	.18¾	.21
Groco 54	lb.	.16½	.17¾
S-2-A (dlvd.)	lb.	.16½	.18¾
S-2-B (dlvd.)	lb.	.15	.17¾
Stearic Acid, Other			
Neo-Fat 1-58	lb.	.1190	.1315
1-60	lb.	.1400	.1525
1-65	lb.	.1450	.1575
White Lead Basic Carbonate	lb.	.14¾	.15¾
White Lead Basic Sulfate	lb.	.13¾	.14¾
Zinc Laurate (c.l.)	lb.	—	.29
Laurex	lb.	.24	.25
Zinc Stearate	lb.	.34	.36
Aquazinc	lb.	.20	.35

Unclassified Activators

Actifat (dms.)	lb.	—	.18
Aero Ac 50	lb.	.50	.56
Aktone	lb.	.20	.21
Barak	lb.	—	.60
Curade	lb.	.57	.59
D-B-A	lb.	—	1.95
Delac J	lb.	.55	.57
Dibutylamine (dlvd.)	lb.	.49	.52½
MODX-B	lb.	.20	.25
NA-11	lb.	—	.65
Palmalene (drums)	lb.	—	.15
Polyac	lb.	—	1.60
Ridacto (drums)	lb.	.22	.24
Snodotte (dlvd.)	lb.	.16½	.17¾
SOAC (min. 10 dms.)	cwt.	—	8.00
SOAC-KL (min. 10 dms.)	cwt.	—	8.00

ANTI-COAGULANTS

Anhydrous Ammonia (l.c.l.)	lb.	.17	.21
Aqua Ammonia (dms.)	lb.	.031	.035
M.B.M. (l.c.l.)	lb.	—	.35

ANTI-FOAMING AGENTS

Aero Anti Foam H	lb.	—	.12½
Regular	lb.	—	.08½
D.C. Antifoam A	lb.	5.65	6.65
Defoamer 630	lb.	—	.12½
Modicol A	lb.	.12	.15
B	lb.	.35	.40

ANTI-OXIDANTS

Agerite Alba	lb.	2.20	2.30
Gel	lb.	.60	.62
Hipar	lb.	.91	.93
H. P.	lb.	.67	.69
Powder	lb.	.49	.51
Resin	lb.	.65	.67
Resin D	lb.	.49	.51
Stalite	lb.	.49	.51
White	lb.	1.40	1.50
Akroflex C	lb.	.67	.69
F	lb.	.67	.69
Aminox	lb.	.49	.51
Antioxidant 2246	lb.	1.60	1.70
Antox	lb.	.46	.48
Aranox	lb.	—	3.25
Benzoquinone	lb.	1.50	1.75
Betanox Special	lb.	.70	.72
B-L-E	lb.	.49	.51
Carvacrol	lb.	—	.78
Deenax	lb.	.95	1.05
Eugenol C-95%	lb.	—	1.65
Flectol H	lb.	.49	.56
Flexamine	lb.	.67	.69
Hydroquinone	lb.	—	.90
Neozone Standard	lb.	—	.82
A	lb.	.51	.53
C	lb.	—	.67
D	lb.	.49	.51

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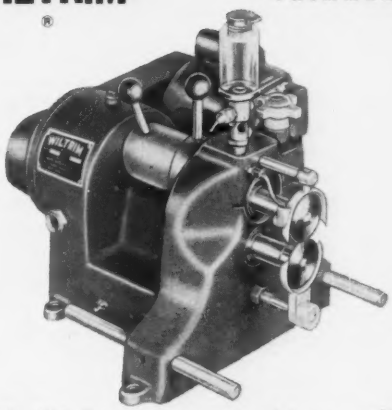
TRIMMER



Wills thirty-five years experience brings you this outstanding successor to the famous earlier Models D, DE, and DM trimmers.

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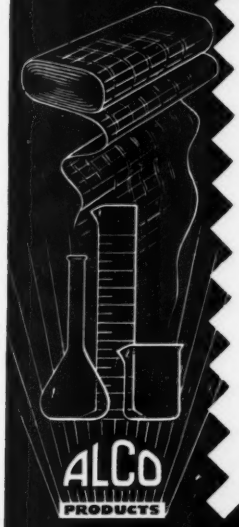

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VULCARITES

Compounding Dispersions of Rubber Chemicals, are now available for Latex Compounding

VULCARITES are supplied as individual dispersions of zinc oxide, sulfur, antioxidants and accelerators. Composite dispersions of these chemicals are also available.

Inquiries on special dispersions formulated to your definite specifications are invited.

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WICA COMPANY INC.
CHARLOTTE, N.C.

ANTI-OXIDANTS (Cont'd)

Oxidex	lb.	—	3.60
Parasone	**lb.**	**—**	**.75**
PDA-10	**lb.**	**.36**	**.38**
PDA-20	**lb.**	**.36**	**.38**
Permalux	lb.	—	1.85
Resorcin, Tech. (dlvd.)	**lb.**	**—**	**.64**
Santoflex AW	lb.	.66	.73
B	lb.	.49	.56
BX	lb.	.60	.67
35	lb.	.67	.74
Santovar-A	**lb.**	**1.30**	**1.37**
O	lb.	1.10	1.17
Santowhite Crystals	lb.	1.55	1.62
Santowhite L	lb.	.49	.56
MK	lb.	1.25	1.32
S.C.R. (tons)	**lb.**	**.32**	**.34**
Stabilite	lb.	.49	.51
Alba	lb.	.69	.74
L	lb.	.60	.62
White	lb.	.49	.51
Stabilizer No. 1	lb.	—	1.55
Stabilizer No. 320	lb.	—	.75
Sunolite	lb.	.20	.23
Tannic Acid, Tech.	lb.	.46	.48
Thermoflex	lb.	1.61	1.63
A	lb.	.98	1.00
Thymol Eugenol	lb.	—	1.08
U.S.P.	lb.	—	3.25
V-G-B	lb.	.65	.67
Wing-Stay S	lb.	.48	.49

ANTI-SCORCHING AGENTS

Armeen HT	lb.	.34	.42
Benzoic Acid—Tech.	**lb.**	**—**	**.43**
Good-rite Vultrol	lb.	.55	.57
Sodium Acetate 60-62% Crystals	lb.	—	.06

ANTISEPTICS AND GERMICIDES

Arquad S	lb.	.22	.25
Formaldehyde (dms.)	lb.	—	.062
G-4 (bbls.)	lb.	.95	2.95
G-11	lb.	—	3.45
Nuodex 100 S.S. (dlvd.)	**lb.**	**—**	**1.05**
Nuodex 100 W.D. (dlvd.)	lb.	—	1.20
Nuodex Zinc 8% (dms.) (dlvd.)	lb.	—	.2125
Ortho Cresol (26°-27°)	lb.	—	.18
Retarder D	lb.	.42	.50
Soligen Drier—Copper 8% (drums)	lb.	—	.22¼
Zinc 8% (dms.)	lb.	—	.21¼
Vancide	**lb.**	**—**	**.80**

ANTI-WEBBING AGENTS (for Latex)

Webnix 33	lb.	1.50	2.00
34	lb.	1.75	2.25

AROMATICS (DEODORANTS)

Bouquet 149	lb.	—	3.00
Coumarin	lb.	—	2.75
Curodex 19	lb.	—	4.75
188	lb.	—	5.75
198	lb.	—	6.75
D-6 Masking Perfume	lb.	—	1.35
Deodorant 65	lb.	—	1.00
Deodorant L-37	lb.	2.00	2.40
L-44	lb.	2.50	2.90
N.L.T.X.	lb.	1.85	2.15
Deodorant Oil GD 3427	lb.	1.70	2.00
4440	lb.	3.00	3.50
5296	lb.	1.30	1.60
General Deodorant 18301	**lb.**	**—**	**2.40**
Latex Perfume 5	lb.	—	3.25
6	lb.	—	7.50
9	lb.	—	.65
Naugaromes (dms.)	**lb.**	**1.50**	**3.00**
Neutrodor 31	lb.	2.00	2.50
Neutroleum Delta	lb.	—	2.60
Gamma	lb.	—	2.60
Parador A	**lb.**	**1.75**	**2.25**
B	lb.	.70	1.00
C	lb.	2.75	3.25
D	lb.	1.50	2.00
E	lb.	.25	.55
F	lb.	.32	.47
GD 5280	lb.	2.00	2.50
GD 5348	**lb.**	**1.90**	**3.25**
I	lb.	1.95	2.25
K	lb.	.45	.60
Perfume Oil Bouquet Vanilla M	**lb.**	**2.40**	**2.75**
Resodor 11	lb.	2.00	2.50
12	lb.	1.45	1.75
Rodo No. 0	**lb.**	**4.00**	**4.50**
No. 10	**lb.**	**5.00**	**5.50**
Rubbarome (dms.)	lb.	1.00	3.80
Rubber Perfume 12	lb.	—	2.85
Russian Leather 7	**lb.**	**—**	**4.10**
Vanillin	lb.	3.00	4.05

BLOWING AGENTS

Ammonium Bicarbonate (dlvd.)	lb.	.0725	.1075
Blowing Agent CP-975	**lb.**	**—**	**.35**
Sodium Bicarbonate, U.S.P. (c.l., bags)	cwt.	—	1.95
Sponge Paste	**lb.**	**—**	**.20**
Unicel	lb.	—	.75
ND	lb.	—	1.40
S	lb.	—	.20
Urea	lb.	.0425	.0475

BONDING AGENTS

Durez 12987	lb.	.48	.53
Interlake Resin No. 4162	lb.	—	1.50
MDI	**lb.**	**7.00**	**7.75**
50	**lb.**	**3.50**	**4.00**
Pliobond 20	gal.	2.75	4.00
30	gal.	3.45	4.70
Reanite	gal.	6.75	7.25
Rex Compounds	**gal.**	**1.30**	**2.85**
Ty-Ply Q (BN & S)	gal.	6.75	8.00

COAGULANTS

Acetic Acid—56% (bbls.)	cwt.	8.11	8.61
Glacial—99½% (bbls.)	cwt.	14.05	14.55
Calcium Nitrate, Tech.., Crystals	lb.	.07	.17
Hydroxyacetic Acid—70% (dms.)	lb.	—	.084
Zinc Nitrate, Tech.	lb.	—	.22½

COLORING AGENTS

Black

Aquablak B (also M, R)	lb.	.0725	.0875
Aquablak S	**lb.**	**.08½**	**.09**
Black Shield 4-35 (dms.)	**lb.**	**—**	**.0825**
Carbon Black—See *Reinforcing Agents*			
Lampblack No. 10	lb.	.06	.09
Mapico Black Iron Oxide (50 lb. bags)	lb.	.1100	.1125
Raven Black Pure Iron Oxide	cwt.	10.75	11.00

Blue

Blue GD, Dispersed	lb.	—	3.95
Blue GD Paste	lb.	—	1.80
Blue YD, Dispersed	lb.	—	2.50
Milori Blue 11840 (dlvd.)	lb.	—	.37
Monastral Fast Blue CPL	**lb.**	**—**	**1.54**
PCD, Dispersed	lb.	—	2.50
Ramapo Blue	lb.	3.40	3.45
Rubber Blue X-1999	lb.	—	1.15
Stan-Tone Blue	lb.	1.40	4.00
Ultramarine	lb.	.14	.30
Vansul Blue M.B.	lb.	.90	2.40
Victoria Blue BP-262-D	lb.	2.25	2.30

Brown

Brown Iron Oxide	lb.	.1225	.1250
Mapico Brown (50 lb. bags)	lb.	—	.1250

Green

Filo Green D-700 (and D-705)	lb.	—	.30
Green Chromium Oxide, Pure	cwt.	34.50	42.00
Green Chromium Oxide, Pure, Hydrated	cwt.	95.00	110.00
Green FD, Dispersed	lb.	—	1.65
Monastral Fast Green GSD, Dispersed	lb.	—	3.20
GSL	**lb.**	**—**	**1.71**
Permansa Green CP-594	lb.	—	1.35
Pigment Green B	lb.	—	1.35
GL-652D	lb.	.88	.93
Ramapo Green	lb.	—	4.00
Rubber Green X-1292	lb.	—	1.00
Stan-Tone Green	lb.	1.50	3.30
Vansul Green M.B.	lb.	1.05	2.45

Maroon

Stan-Tone Maroon	lb.	3.00	3.05
Vansul Maroon M.B.	lb.	1.05	2.80

Orange

Molybdate Orange	lb.	—	.40
Orange FD, Dispersed	**lb.**	**—**	**2.75**
Rubber Orange X-2065	lb.	—	2.60
Stan-Tone Orange	lb.	1.65	4.00
Vansul Orange M.B.	lb.	2.15	3.15

Red

Antimony Trisulfide	**lb.**	**.55**	**.68**
R. M. P. Sulfur Free	**lb.**	**.63**	**.68**
R. M. P. No. 3	lb.	.55	.60
Cadmium Red	lb.	.95	1.25
Cadmolith Red (bbls.)	lb.	1.30	1.55
Graphic Red (dlvd.)	lb.	—	.80
Indian Red, American, Pure	cwt.	11.50	11.75
Doxco (English)	cwt.	11.50	11.75
Mapico Reds (50 lb. bags)	lb.	.1175	.12
Oximony Iron Oxide	lb.	—	.09
Red Iron Oxide, Light	cwt.	11.50	11.75
Red PBD Dispersed	lb.	—	1.55
2BD, Dispersed	lb.	—	1.65
2BL	**lb.**	**—**	**1.15**
PBL	lb.	—	1.50
Rubanox Red CP-762 (dlvd.)	lb.	—	1.40
Rubber Red CP-339 (dlvd.)	lb.	—	1.05
Rubber Red RT-364	lb.	—	.75
Rubber Red RT-425	lb.	—	.75
Rubber Red X-1148	lb.	—	.80
Rubbered	lb.	.1150	.1175
Solfast Red CP-663 (dlvd.)	lb.	—	1.80
CP-787 (dlvd.)	lb.	—	1.30
Stan-Tone Red	**lb.**	**1.10**	**3.05**
Sun Burnt Red	lb.	.1150	.1175
Vansul Red M.B.	lb.	.90	2.60
Watchung Red	lb.	—	1.80

White—Lithopone

Albalith	lb.	.06½	.07½
Astrolith	lb.	.06½	.07¼
Cryptone BT	lb.	.08½	.09½
Eagle	**lb.**	**.06¼**	**.06½**
Permalith	**lb.**	**.06¼**	**.06¾**
Ponolith	lb.	.06½	.07¼
Sunolith	lb.	.06½	.07¼

White—Titanium Pigments

Ti-Cal	**lb.**	**.07¾**	**.08¼**
Ti-Pure	**lb.**	**.21½**	**.22½**
Titanox A—all grades (dlvd.)	lb.	.19½	.20¾
RA (dlvd.)	lb.	.21½	.22½
RA-10 (dlvd.)	lb.	.21½	.22½
RA-NC (dlvd.)	lb.	.21½	.22½
RC (dlvd.)	lb.	.07¾	.08¼
RC-HT (dlvd.)	lb.	.07½	.08
Unitane O-220	**lb.**	**.195**	**.205**
OR-250	**lb.**	**.215**	**.225**
Zopaque	**lb.**	**.19½**	**.20¾**

White—Zinc Oxide (American Process)

AZO-ZZZ 11 (and 22, 33, 44, 55)	lb.	.14¾	.15¾
Eagle	lb.	.14¾	.15¾
Horse Head Special	lb.	.14¾	.15¾
XX Red	lb.	.14¾	.15¾
XX-505	lb.	.16¼	.17¼
Protox 166	lb.	.14¾	.15¾
167	lb.	.14¾	.15¾
St. Joe Black Label	lb.	.14¾	.15¾
Green Label	lb.	.14¾	.15¾
Red Label	lb.	.14¾	.15¾

White—Zinc Oxide (Dispersed)

Dispersed Zinc Oxide	lb.	—	13

White—Zinc Oxide (French Process)

AZO-ZZZ 66	lb.	.17	.18
Eagle Green Seal	lb.	.16½	.17½
Eagle Red Seal	lb.	.16	.17
Eagle White Seal	lb.	.18	.19
Florence Green Seal	lb.	.16½	.17½
Red Seal	lb.	.16	.17
White Seal	lb.	.17	.18
Kadox 25	lb.	.17	.18
Kadox 15, 17 and 72	lb.	.14¾	.15¾
U. S. P. 12	lb.	.18	.19

White—Zinc Sulfide

Cryptone ZS-800	lb.	.20	.21

Yellow

Anchor Brand Pure Iron Oxide	cwt.	9.00	9.25
Cadmolith Yellow (bbls.)	**lb.**	**—**	**.95**
Chrome Yellow	lb.	—	.25
Chrome Yellow 12310	lb.	—	.28
Ferrox	**cwt.**	**7.50**	**8.50**
Mapico Yellow (50 lb. bags)	lb.	.0950	.0975
Rubber Yellow X-1940	**lb.**	**—**	**1.60**
Stan-Tone Yellow	lb	1.00	2.25
Toluidine Yellow	**lb.**	**—**	**1.70**
YL-556-D	lb.	—	.82
Oximony Iron Oxide	lb.	—	.06¾
Vansul Yellow M.B.	lb.	.95	1.55
Yellow GD, Dispersed	lb.	—	1.85
GL	**lb.**	**—**	**1.35**
Zinc Yellow	lb.	—	.21

DESTABILIZING AGENTS (for Latex)

D-Stayb	lb.	—	1.60

DISPERSING AGENTS

Agchem SA-19	lb.	—	.30
SA-20	lb.	—	.70
Anchoid*	lb.	.24	.25
Armeen 18	lb.	.42	.50
Beaconol 52	**lb.**	**.60**	**.75**
Darvan No. 1 (and No. 2)	lb.	.21	.40
Daxad 11 (21, 23)	**lb.**	**.08**	**.35**
Dilex	lb.	—	.32
Dispersaid	**lb.**	**1.25**	**1.35**
Furala	lb.	.06½	.07½
Hallnd	lb.	.04½	.05½
HornKem No. 1	gal.	—	1.60
No. 3G	gal.	—	1.75
No. 12	lb.	—	.17
Marasperse C	lb.	.06	.06½
CB	lb.	.11½	.13½
N	lb.	.09	.10
Modicol C	lb.	.08	.12
Rubbex	**lb.**	**—**	**.27½**
Stan-Chem BQC	**lb.**	**.12¼**	**.17¼**
1067	lb.	—	.13½
1471	lb.	.1687	.2187
2251	lb.	.12¼	.17¼
Trenamine D-25	**lb.**	**.32½**	**.36**
Triethanolamine (drums) (dlvd.)	lb.	.21½	.22½
Yelkin TT	lb.	.14	.18
Zinsper	**lb.**	**—**	**.15**

EXTENDERS

Advagum 1098	lb.	—	.64
Bunaweld Polymer No. 780	**lb.**	**—**	**.22**
No. 5514	lb.	—	.35
D-92 (and D-93) (dms.)	lb.	—	.12
Extender 600	lb.	—	.1480
PR-162 Latex (dms.)	gal.	1.00	1.60
Synprolac	lb.	—	.19
Synprowax	lb.	.16	.19
Vistanex	lb.	—	.32

EXCLUSIVE AGENTS

RCMA
RAY-BRAND
Centrifuged Latex

REVERTEX
72-75% Latex Concentrate

- Normal Latex
- GR-S Latex Concentrate
- Natural and Synthetic Latex Compounds

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RUBBER CORPORATION OF AMERICA
274 Ten Eyck Street, Brooklyn 6, N. Y.
111 West Monroe Street, Chicago 3, Ill.

SALES REPRESENTATIVES: Charles Larkin II, 250 Delaware Ave., Buffalo 2, N.Y.; H. L. Blachford Ltd., 977 Aqueduct St., Montreal 3, Canada; Ernesto Del Valle, Tolsa 64, Mexico D.F.

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REG. U.S. PAT. OFF.

RUBBER STRIP CUTTER
PATENTED

A PORTABLE machine capable of stripping slab rubber up to 1″ thick at the rate of 20,000 feet in 8 hours. Any width desired.

SPECIAL FEATURES
- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
- Has repulsion induction motor which carries any overloads.
- Automatic sharpener device keeps knife keen and sharp.
- Has base with rollers and is very easy to handle.

Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Cuts all grades of rubber including pure gum, sponge, etc. Cuts squarely—no rejects.

Now in use by many leading Rubber Manufacturers & Jobbers

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Stamford
"FACTICE" VULCANIZED OIL
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Our products are engineered to fill every need in natural and synthetic rubber compounding wherever the use of vulcanized oil is indicated.

We point with pride not only to a complete line of solid Brown, White, "Neophax" and "Amberex" grades, but also our aqueous dispersions and hydro-carbon solutions of "Factice" for use in their appropriate compounds.

Continuing research and development in our laboratory and rigid production control has made us the leader in this field.

The services of our laboratory are at your disposal in solving your compounding problems.

THE STAMFORD RUBBER SUPPLY CO.
STAMFORD, CONN.
Makers of Stamford "Factice" Vulcanized Oil Since 1900
(Reg. U.S. Pat. Off.)

FILLERS (Inert and Reinforcing)

Abrasives			
Carbonite	lb.	.15	- .95
Lionite	lb.	.09¾	- .90
Pumice	lb.	.03	- .05
Aluminum Hydrate	lb.	.07	- .10
Aluminum Silicate			
Silical	ton	37.00	- 55.00
Marter White	ton	18.50	- 30.00
Barium Carbonate (l.c.l.)	ton	72.50	- 90.00
Barytes			
No. 1 Floated, White	ton	34.85	- 49.65
No. 2 Floated, Unbleached	ton	—	- 32.85
No. 22 Barytes (c.l.)	ton	—	- 18.37
Foam A	ton	—	- 34.85
Bentonite (c.l.)	ton	—	- 11.50
SPV Volclay (c.l.)	ton	—	- 11.50
Blanc Fixe	ton	72.50	-120.00
Calcium Carbonate			
Atomite (c.l.)	ton	—	- 30.00
B.I. White No. 1 (c.l.)	ton	—	- 7.50
B.I. White No. 2 (c.l.)	ton	—	- 7.00
B.I. White No. 390 (c.l.)	ton	—	- 5.75
Blue-Star XX	ton	—	- 15.00
Calcene T	ton	50.00	- 60.00
Caltec	ton	40.00	- 57.50
Calwhite	ton	—	- 17.00
Camelwite	ton	—	- 30.00
Gamaco	ton	—	- 30.00
Kalite (c.l.)	ton	—	- 40.00
Lesamite (c.l.)	ton	—	- 27.50
Lim-Cal (c.l.)	ton	—	- 12.50
Millical (c.l.)	ton	—	- 27.50
Multifex	ton	—	-105.00
Non-Fer-Al	ton	—	- 20.00
Purecal M	ton	45.00	- 52.50
U	ton	105.00	-125.00
Sierracal	ton	15.00	- 18.50
Super Multifex	ton	—	-145.00
Surfex (c.l.)	ton	—	- 30.00
Suspenso (c.l.)	ton	—	- 22.00
Witcarb R (c.l.)	ton	105.00	-120.00
R-12 (c.l.)	ton	45.00	- 66.00
York White	ton	—	- 9.00
Calcium Silicate			
Silene EF	ton	110.00	-120.00
L	ton	115.00	-125.00
Calcium Sulfate, Anhydrous			
Snow White Filler	ton	—	- 18.00
Calcium Sulfate, Hydrous			
Crysta-Cal (c.l.)	ton	—	- 12.50
Terra Alba No. 1	ton	12.00	- 14.40
Chalk Whiting (l.c.l.)	lb.	.0150	- .0175
Recco Paris Whiting	ton	—	- 28.00
Clay			
Alsilite (c.l.)	ton	14.00	- 22.50
Alsite (c.l.)	ton	—	- 14.00
Aluminum Flake	ton	22.50	- 60.00
A.S.P. No. 1 (c.l.)	ton	—	- 35.00
No. 11 (c.l.)	ton	—	- 40.00
Buca (c.l.)	ton	—	- 45.00
Burgess No. 20	ton	—	- 35.00
No. 30	ton	—	- 37.00
Burgess Iceberg	ton	—	- 50.00
Burgess Polyclay	ton	—	- 45.00
Catalpo (c.l.)	ton	—	- 35.00
Champion	ton	—	- 14.00
C.S.D. (c.l.)	ton	—	- 13.50
Crown	ton	—	- 14.00
Dixie (c.l.)	ton	—	- 14.00
Hi-White R	ton	—	- 13.50
Hydratex R	ton	—	- 30.00
Kaolloid Clay (c.l.)	ton	—	- 10.50
Markham (c.l.)	ton	14.00	- 35.00
McNamee (c.l.)	ton	—	- 13.50
Oldham (c.l.)	ton	13.50	- 35.00
Paragon	ton	—	- 13.50
Pigment 5	ton	21.85	- 36.00
Pigment 22	ton	16.50	- 22.50
Pigment 33	ton	—	- 37.00
Recco (c.l.)	ton	—	- 14.00
RX-43	ton	—	- 33.00
Stan-Clay	ton	25.00	- 30.00
Stellar-R	ton	—	- 50.00
Suprex	ton	—	- 14.00
Upton	ton	19.50	- 21.50
Whitetex (c.l.)	ton	—	- 50.00
Witco No. 1 (c.l.)	ton	14.00	- 37.50
No. 2 (c.l.)	ton	14.00	- 37.50
Diatomaceous Earth	ton	30.00	- 50.00
Kaylorite (c.l.)	ton	—	- 30.00
Lorite	ton	—	- 30.00
Dolomite (c.l.)	ton	11.00	- 12.00
Flock			
Cotton, white and colored	lb.	.10	- .22
Filfloc F 40-9000	ton	—	- .16
Filfloc F 6000	lb.	—	- .22
Polycel	ton	145.00	-178.00
Rayon, bleached or dyed	lb.	.81	- 1.50
Rayon, grey	lb.	—	- .18
Rayon, pink	lb.	—	- .14
Solka-Floc (l.c.l.)	lb.	.05½	- .15
Wool, bleached or dyed	lb.	.70	- 1.00
Glue, Bone (dlvd.)	lb.	.18	- .20½
Graphite	lb.	.05	- .20
Ground Glass (l.c.l.)	lb.	.04	- .06
Leather, Shredded	lb.	.05	- .17
Lignin	lb.	.03	- .06
Indulin	lb.	.09	- .10
Limestone, Pulverized	ton	3.25	- 10.00
Industrial Filler No. 100	ton	—	- 5.75
Micro Velva	ton	45.00	- 47.00
Velvet Filler, Regular	ton	20.00	- 22.00
Magnesium Carbonate	lb.	.09	- .10
K & M Clearcarb	lb.	.1175	- .1225
Magnesium Oxide	lb.	.05	- .06

FILLERS (Cont'd)

Magnesium Silicate	ton	18.00	- 35.00
Airex	ton	25.00	- 27.00
Asbestol	ton	20.00	- 22.00
Blue Star Talc	ton	—	- 23.00
L.S. Silver	ton	23.50	- 25.50
Sierra White	ton	21.25	- 23.25
Mica	lb.	.01¼	- .07¾
Concord	lb.	.07	- .07¾
Micro-Mica	lb.	.06¾	- .07½
Mineralite (c.l.)	ton	25.00	- 40.00
Silversheen	lb.	.07	- .07¾
Triple A Mica (c.l.)	ton	—	- 25.00
Vermiculite	lb.	.075	- .085
Wet Ground Biotite Mica	lb.	.05½	- .06¼
Wet Ground Mica No. 160	lb.	.07	- .07¾
Pyrophyllite			
Pyrax A (c.l.)	ton	—	- 12.50
WA (c.l.)	ton	—	- 15.00
Silica	ton	16.00	- 27.00
Blue Star	ton	—	- 21.50
Slate, Powdered (l.c.l.)	ton	15.00	- 20.00
Talc, Domestic	ton	10.00	- 27.00
Nytal 200	ton	23.00	- 40.00
300	ton	35.00	- 52.00
Walnut Shell Flour	ton	45.00	-111.00
Whiting, Commercial	ton	—	- 7.00
Cameline (c.l.)	ton	8.50	- 10.00
C-C-O White	ton	—	- 17.00
Keystone (c.l.)	ton	—	- 16.00
Rambo No. 1 White	ton	—	- 7.50
No. 6 White	ton	—	- 9.00
Snowflake (c.l.)	ton	—	- 18.00
Veroc (c.l.)	ton	—	- 7.50
Welco (c.l.)	ton	—	- 7.50
York White R (c.l.)	ton	—	- 8.00
Wood Flour	ton	22.00	- 49.00

FINISHING MATERIALS, SURFACE

Beaco Finishes	gal.	1.05	- 1.35
Black Out	gal.	4.50	- 8.00
Shellac, Orange Gum	gal.	.45	- .54
VanWax	gal.	1.25	- 1.30

LUBRICANTS, MOLD

Aquadag	lb.	3.15	- 3.45
Aquarex D	lb.	—	- .76
L Paste	lb.	—	- .85
ME	lb.	—	- .92
MDL Paste	lb.	—	- .30
WA Paste	lb.	—	- .25
Akro Gel	lb.	—	- .165
Borax, Granular (l.c.l.)	ton	81.00	- 86.00
Carbowax 4000	lb.	.31	- .35
Colite Concentrate (dms.)	gal.	—	- .90
Concentrex	lb.	—	- .25
D.C. 7 Compound	lb.	6.20	- 6.80
D.C. Emulsion No. 35	lb.	1.68	- 3.50
35A	lb.	1.68	- 3.50
35B	lb.	1.68	- 3.50
D.C. Mold Release Fluid	lb.	4.14	- 6.00
Dipex	lb.	.14	- .18
Dri-Lube	lb.	—	- .22
Erien Mold Lubricant	gal.	1.25	- 1.50
Glydag	lb.	1.30	- 2.00
Hawkeye Flake (dlvd.)	lb.	—	- .12
Kokobace	lb.	—	- .12
Latex-Lube GR (dlvd.)	lb.	.18½	- .19¼
R-66 (dlvd.)	lb.	—	- .15
Liqui-Lube (dlvd.)	lb.	—	- .14¾
NF (dlvd.)	lb.	—	- .15¼
NT (dlvd.)	lb.	—	- .15¼
Lubrex	lb.	.25	- .30
Lubri-Flo	gal.	10.00	- 12.00
Migralube	lb.	—	- .35
Mold Lubricant No. 72 Conc.	gal.	2.50	- 4.00
No. 735	gal.	1.26	- 2.75
Moldeze No. 1	gal.	—	- 36.00
No. 3	gal.	—	- 7.50
Mold-Brite	gal.	—	- 1.50
Mold-Slick	lb.	.202	- .215
Mold-White	gal.	—	- 2.00
Nopcolube	lb.	—	- .15
Orvus WA Paste (dms.)	lb.	—	- .25
Prodag	lb.	.25	- .38
Purity Flake (dlvd.)	lb.	—	- .14
Redotex Flakes (dlvd.)	lb.	.15¾	- .16
Powder (dlvd.)	lb.	.16½	- .16½
Rubber-Flo	gal.	1.15	- 1.50
Rubber-Glo	lb.	—	- .94
Rusco Mold Paste	lb.	—	- .25
Sericite (l.c.l.)	ton	65.00	- 75.00
Thermalube	lb.	—	- .11
Ulco Mold Soap	lb.	.12	- .23
Ucon Lubricants	lb.	.27½	- .35½
Werkrite Flakes (dlvd.)	lb.	.13¾	- .14
Powder (dlvd.)	lb.	.14¾	- .14¾

LUBRICANTS, RUBBER

Extrud-o-Lube	gal.	—	- 1.57
G.B. Naphthenic Neutrals	gal.	.11	- .18
Propylene Stearate (drums)	lb.	—	- .40

LUBRICANTS, RUBBER SURFACE

Barium Stearate	lb.	.34	- .36
Calcium Stearate	lb.	.32	- .34
Glycerized Lubricant	gal.	—	- 1.25
Polyethylene Glycol	lb.	—	- .23
Rexanol	lb.	—	- .12
Separex	lb.	—	- .25
Slab-Dip	lb.	—	- .15
Wet-Zinc	lb.	—	- .23¼
Zinc Stearate	lb.	.34	- .36

MOLD CLEANERS

Actusol (dlvd.)	gal.	1.40	- 1.60
Metso 99	cwt.	4.00	- 5.85
Granular	cwt.	3.50	- 5.15
Rubber-Sol	gal.	2.75	- 3.25
Shelblast	ton	80.00	-140.00
Sprex A.C. (dlvd.)	lb.	.15¼	- .15½

PEPTIZING AGENTS

Peptizer P-12	lb.	.84	- 1.00
RPA 2	lb.	—	- .65
3	lb.	—	- .46
3-RO	lb.	—	- .49
5	lb.	—	- .57

PLASTICIZERS & SOFTENERS

AA (drums)	lb.	—	- .20¼
Acto 500	lb.	—	- .09
Adipol BCA (dms.)	lb.	.43½	- .44
2EH	lb.	.42	- .43
10A	lb.	.42	- .43
American Pine Tar	lb.	.0350	- .0473
Arneel	lb.	.22	- .27
Arolene 1980 (c.l.)	lb.	—	- .10
Aromatic Tar	gal.	.0573	- .1973
Bardol	lb.	.02½	- .03½
B	lb.	.05½	- .05¾
Bayol D	gal.	—	- .382
F	gal.	—	- .52
Beeswax, Refined & Bleached	lb.	.60	- .65
Yellow Refined	lb.	.52	- .55
Bondogen	lb.	.55	- .60
B.R.C. No. 20	lb.	.0125	- .03
B.R.H. 2	lb.	.02	- .02
BRs 700	lb.	.0175	- .026
B.R.T. 3	lb.	.024	- .025
4	lb.	.0225	- .023
7	lb.	.0265	- .0275
B.R.V.	lb.	.0325	- .049
Bunarex Resins	lb.	.05	- .06
Bunatak AH	lb.	.08	- .09
U	lb.	—	- .15
No. 90	lb.	—	- .08
No. 210	lb.	—	- .12
Burgundy Pitch	lb.	.1026	- .1050
Butac	lb.	.10½	- .11½
Butoxyethyl Diglycol Carbonate	lb.	.40	- .41
Butyl Benzyl Sebacate	lb.	.56½	- .59¼
Butyl Carbitol Perlargonate (dms.)	lb.	—	- .645
Butyl Cellosolve Perlargonate (dms.)	lb.	—	- .68
Butyl Palmitate	lb.	—	- .26½
Butyl Roleate	lb.	.176	- .18
Butyl Stearate-CP (dms.)	lb.	.29½	- .33¾
BWH-1	lb.	—	- .14
Cabflex Di-BA (dms.)	lb.	.38½	- .39½
Di-OA (dms.)	lb.	.42	- .43
Di-OP (dms.)	lb.	.37½	- .38½
Califlux 510, 550	lb.	.025	- .0325
G.P.	lb.	.0125	- .02
R-100	lb.	.04½	- .05¼
TT	lb.	.02	- .02¾
Campol (t.c.)	ton	—	- 42.00
Candelilla Wax Prime	lb.	.67	- .75
Capryl Benzyl Sebacate	lb.	.64	- .66¾
Carbonex	lb.	.0325	- .0375
S Flakes	lb.	.04	- .045
S Plastic	lb.	.0385	- .0435
644	lb.	.0375	- .0425
Carbowax 4000 (drums)	lb.	—	- .29
Cardolite 615	lb.	.33¾	- .36¾
816	lb.	.25¾	- .28¾
Carnauba Wax, Crude	lb.	.80	- 1.04
Refined	lb.	.87	- .94
Substitute	lb.	.45	- 1.08
Yellow	lb.	1.15	- 1.20
Celluflex	lb.	.36½	- .38½
Ceresine Wax	lb.	.14	- .26
Chlorowax 40	lb.	.12½	- .13½
Contogum	lb.	.06¾	- .10¼
CTA Polymer	gal.	.15	- .29
Cumar Resins	lb.	.05½	- .14½
D.C. 200 Fluid	lb.	4.14	- 6.00
D.B.M.	lb.	—	- .30
Degras, Common	lb.	—	- .12
Diamylphenol (l.c.l., dms.)	lb.	—	- .28
Dibenzyl Sebacate	lb.	.69½	- .72¼
Dibutoxethyl Sebacate	lb.	—	- .5634
Dibutyl Phthalate	lb.	.28¼	- .32
Dibutyl Sebacate—Tech.	lb.	.53½	- .56¼
C.P.	lb.	.55½	- .58¼
Dicapryl Adipate	lb.	.40½	- .43¼
Dicapryl Phthalate	lb.	.37	- .39¾
Dicapryl Sebacate	lb.	.57½	- .60¾
Di-Carbitol Phthalate (dms.)	lb.	.41½	- .42
Dicyclohexyl Phthalate	lb.	—	- .42
Dielex	lb.	.0625	- .0650
Diethyl Phthalate (t.c.)	lb.	—	- .24
Di-2-ethlyhexyl Phthalate (t.c.)	lb.	—	- .37
Dihexyl Adipate	lb.	.33	- .35¼
Dihexyl Phthalate	lb.	.28½	- .31¼
Dihexyl Sebacate	lb.	.45½	- .48¼
Di Isobutyl Azelate (dms.)	lb.	.54	- .57
Di-iso-octyl Adipate (dms.)	lb.	.40½	- .43¼
Di-iso-octyl Phthalate (t.c.)	lb.	.37	- .39¾
Dimethyl Phthalate (t.c.)	lb.	—	- .23
Dimethyl Sebacate	lb.	.72½	- .75¼
Dioctyl Phthalate (dms.)	lb.	.37½	- .39¾
Dioctyl Sebacate (dms.)	lb.	.58½	- .61¼
D.I.O.P. (dms.)	lb.	.36	- .38½
Dipolymer Oil	gal.	.33	- .38

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PLASTICIZERS & SOFTENERS (Cont'd)

Dispersing Oil No. 10	lb.	.0525	.055
Dutrex A (B, 5, 6)	lb.	.02½	.03¾
15	gal.	.10	.189
20, 21, 25	lb.	—	.03
ELA	lb.	—	.80
Elastex 10-P	lb.	.40	.42½
50-B	lb.	.34½	.37
DCHP	lb.	.42½	.43½
Estac	lb.	—	.16
Ethox (dms.)	lb.	.41½	.42
Flexol B-400	lb.	.27	.29
DOP	lb.	.37	.39½
TOF	lb.	.41½	.44
3GH	lb.	.42	.44
3GO	lb.	.51¾	.53½
4GO	lb.	.36	.38½
8HP	lb.	.38	.40½
8N8	lb.	.34	.36½
Galex W-100	lb.	.13½	.15
G. B. Light Process Oil	lb.	.025	.0325
G. B. Naphthenic Neutrals	gal.	.11	.18
Good-Rite GP233	gal.	.40½	.43
GP261	gal.	.36	.38½
Harflex 500 (dms.)	lb.	.36½	.39¼
Hercolyn (dlvd.)	lb.	.16	.16½
Herron-H.T.	gal.	.2400	.2700
Herron-Plas	lb.	.0350	.0375
Herron-Wax	lb.	.0500	.0550
Indonex 632½ (633½, 634½, 638½)	gal.	.1100	.1700
JMH	lb.	—	.85
Kapsol	lb.	.35½	.36
KP 23 (dms.)	lb.	.31½	.32½
70 (dms.)	lb.	.34	.34½
120 (dms.)	lb.	.37½	.38
140 (dms.)	lb.	.45½	.46
150 (dms.)	lb.	.29	.30
201	lb.	.41½	.42
Kremol 40	gal.	.36	.46
50	gal.	.36	.46
Kronisol (drums)	lb.	.35	.35½
Kronitex (drums)	lb.	.31½	.32½
Lanolin, Tech. Anydrous	lb.	.21	.23
Lead Oleate	lb.	—	.30½
Lindol	lb.	.29	.45
2-Mercaptoethanol (drums)	lb.	—	.75
Methox (dms.)	lb.	.36½	.37
Methyl Laurate	lb.	.25	.27
Methyl Oleate	lb.	—	.20
Methyl Stearate (dms.)	lb.	—	.30
Modicol G	lb.	—	.23
R	lb.	—	.17
Montan Wax, Crude	lb.	.18	.20
Montan Wax (c.l.)	lb.	.15	.18
Monty Wax	lb.	—	.30½
Morflex No. 100	lb.	.37	.38¼
Natac	lb.	.10	.11
Neolene 210 (t.c.)	lb.	—	.16
212 (t.c.)	lb.	—	.14
220 (t.c.)	lb.	—	.15
Nerium	lb.	—	.09
Nevillac Resins (dms.)	lb.	.23	.45
Neville Resins (dms.)	lb.	.10½	.15½
Nevindene Resins (dms.)	lb.	.12½	.15½
Nevinol (dms.)	lb.	—	.17
Nevoil	lb.	.02¼	.03¼
Nevtex 10 (dms.)	lb.	.08¾	.10½
Nuba 1 (and 2) (dms.)	lb.	—	.04
35 (dms.)	lb.	.05¾	.06¼
15 (and 30) Oil (dms.)	lb.	—	.22½
No. 480 Oil Proof Resin	lb.	—	.13½
Ohopex Q10 (dms.)	lb.	.36½	.37½
Opalwax	lb.	.37	.38
Ortho-Nitrobiphenyl	lb.	.06	.11
Ozokerite Wax No. 64 White	lb.	.31	.32
Yellow	lb.	.25	.26
P-1 (and 4)	lb.	—	.29
P-4C	lb.	—	.38½
P-8	lb.	—	.28
P-75	lb.	.66	.72
Pale 4 (and 1000)	lb.	—	.22¼
Palm Oil	lb.	—	.11
Paradene Resins (dms.)	lb.	.05	.06
Para Flux (dms.)	gal.	.1825	.1925
2016 (dms.)	gal.	.22	.23
Para Lube (t.c.l.)	lb.	.046	.048
Parmo	lb.	.06	.13½
Pepton 22	lb.	.72	.75
PG-16 (drums)	lb.	—	.23½
Picco 10 (and 25)	lb.	—	.12
75 (and 100)	lb.	—	.11½
Rubber Resin 100	lb.	.13¼	.14
S.O.S.	gal.	.29	.34
Piccocizer 30	lb.	.05½	.06
Piccolastic A (and B, C, D, E)	lb.	.24	.24½
FT, FHF and FX	lb.	.1490	.1540
T-135	lb.	.21	.21½
Piccolyte S Resins	lb.	.15	.15¼
Piccolyte WW Resins	lb.	.45	.47
Piccoumaron Resins	lb.	.05	.15
Piccovar	lb.	.12	.12½
Piccovol	lb.	.02½	.04
Pictar	gal.	.25	.30
Plas-Blend 360	lb.	.03	.04
Plastac M	lb.	—	.09¼
Plasticizer 2286	lb.	—	.26¼
Plasticizer SC	lb.	.49	.52
Plasticizer VA-1	lb.	—	.40
Plasticizer W-13	lb.	.37	.38¼
Plasticizer XP-3	lb.	—	.50

PLASTICIZERS & SOFTENERS (Cont'd)

Plastoflex 50	lb.	.26½	.29
52	lb.	.31	.32½
VS	lb.	.40	.42½
Plastolein 9050 (c.l.)	lb.	—	.48
9055	lb.	—	.39
9058	lb.	—	.47
9250	lb.	—	.31
9715	lb.	—	.38
9720	lb.	—	.30½
Plastone	lb.	.27	.30
Polycin 781	lb.	—	.24
Polymel C-128	lb.	.19½	.20½
D	lb.	.22	.24
H-2	lb.	.22	.24
6	lb.	.06¾	.10
7	gal.	.23	.28
Process Oil C-255 (c.l.)	gal.	—	.22
Propylene Stearate (dms.)	lb.	—	.32
PT 400 Pine tar (600, 800) (t.c., dms.)	lb.	.0387	.0511
Reogen	lb.	.11¾	.12
465 Resin (drums)	lb.	.05	.05½
Resin 731-C	cwt.	—	13.50
Resin C	lb.	.0250	.0335
Resinex	lb.	.03¼	.03¾
L-4	lb.	.02¼	.03
Reflex	lb.	—	.15
Ridbo 369 (drums)	lb.	.08	.09
369-F (drums)	lb.	—	.12
Rosin Oil	gal.	.54	1.20
R.P.A. No. 2	lb.	—	.65
No. 3	lb.	—	.46
No. 5	lb.	—	.57
R.S.O. Softening Oil	lb.	.03	.05
Rubberol	lb.	—	.21½
Rubtar	gal.	—	.40
Santicizer B-16	lb.	.50	.52
E-15	lb.	.47	.49
M-17	lb.	.44	.46
No. 107	lb.	.40	.42½
No. 140	lb.	.29	.31
No. 141	lb.	.40	.42½
No. 160	lb.	.34	.36
Sealol 42	gal.	—	1.10
Sherolatum	lb.	.02¾	.05½
Sherosope F and F445	lb.	.16¾	.18¼
L	lb.	.17½	.19
N	lb.	.17¼	.18¾
T	lb.	.16¾	.18¼
Softener No. 20	gal.	.09	.25
S.P.C.	lb.	—	.19½
Staflex IXA	lb.	.34	.36
Stanolind Petrolatum	lb.	.037	.081
Wax	lb.	.25	.30
Staybelite Resin (dms.)	cwt.	—	9.00
Sunny South Burgundy Pitch	lb.	.0679	.0743
Sunny South Pine Tar	lb.	.0350	.0473
Sunny South Rosin Oil	gal.	.47	.63
Superla Wax	lb.	.25	.30
Syncera Wax	lb.	.175	.225
Synplasticizer	lb.	—	.10
Syn Tac (c.l.)	gal.	—	.33
Tar, Refined	gal.	.12	.17
K-Tarnel NR (t.c.)	lb.	—	.0851
Terpene A	gal.	—	.65
TP-90B	lb.	—	.65
TP-95	lb.	—	.55
TP98	lb.	—	.50
Triacetin	lb.	.34	.45
Tricresyl Phosphate	lb.	.30	.32½
Turgum S	lb.	.08¾	.09¾
Vanadiset A	gal.	.13	.20
Vanadiset B, C, D	lb.	.022	.055
Pulverized	lb.	.064	.09
Solution	gal.	.40	.65
Vistac No. 1	gal.	1.00	1.16
No. 2 (c.l.)	gal.	1.22	1.26
No. 4 (c.l.)	gal.	1.32	1.36
P	lb.	—	.17
Witresin—Granular	ton	41.00	43.00
Solid	ton	36.00	38.00

PROCESSING AIDS

Castor Oil, Processed (dms.)	lb.	—	.22¼
Refined (drums)	lb.	—	.20½
Castorwax (min. 250 lbs.)	lb.	—	.28½
Dutrex 7	lb.	.02½	.03¾
30	gal.	.24	.27
ELA	lb.	—	.80
Heron S.P.O.	lb.	.22	.23
Millrex	lb.	—	.15
Resin No. 510	lb.	.13½	.16½
Zyrox	lb.	.50	.79

PROTECTIVE & STABILIZING AGENTS

Acacia	lb.	.12¾	.21
Agchem SA-9 (to SA-12)	lb.	.65	1.02
Alpha Protein	lb.	.24	.28
Ammonium Alginate	lb.	—	.95
Aroostocrat	lb.	—	.07½
Carob Bean Flour	lb.	.33	.35
Casein	lb.	.28	.38
Ethylene Diamine 68%	lb.	.57	.58
Karaya Gum	lb.	.20	.50
Prosein	lb.	.0600	.0630
Rex Compound No. 2801	lb.	—	.15
Stablex B	lb.	.50	.95
K	lb.	.27	.35
Tragacanth Flakes	lb.	.60	1.35

RECLAIMING AGENTS

Armeens C	lb.	.50	.58
T	lb.	.42	.50

RECLAIMING AGENTS (Cont'd)

No. 517 H.B. Oil	gal.	.11½	.16½
535	gal.	.22	.27
C-6 Oil (and 28, 32)	gal.	.33	.38
C-10 Oil	gal.	.25	.30
C-33 Oil	gal.	.17½	.22¾
Caustic Soda—Flake 76% (c.l., drums)	cwt.	—	3.60
Liquid 50% (t.c.)	cwt.	—	2.40
Solid 76% (c.l., dms.)	cwt.	—	3.20
Cresylic Acid (99-100%)	gal.	1.55	1.69
D-4	gal.	.23	.28
E-5	gal.	.21	.26
G. B. Reclaiming Oil	gal.	.12	.18
Heavy Aromatic Naphtha (t.c.)	gal.	—	.12¼
LX-77 Reclaiming Solvent	gal.	.21	.30
LX-572 Reclaiming Oil	gal.	.23	.28
Neo-Fat D-242	lb.	.05½	.07¼
PRR 1	gal.	.15	.35
PT 67 Light pine oil	gal.	—	.50
PT 101 Pine tar oil	lb.	.0387	.0511
Q Oil	gal.	.246	.296
Reclaiming Oil 1621	lb.	.03	.04
Reclaiming Oil 3186 (t.c.)	gal.	.28	.38½
Reclaiming Oil 3186-G	gal.	.25	.36½
Reclaiming Reagent No. 4	lb.	.12	.15
R.P.A. No. 3	lb.	—	.46
Soda Ash (c.., bags)	cwt.	—	1.40
Solvenol 1 (dms.)	—	—	.36
Solvent 534	gal.	.20½	.26½
Solvent Oil 21	gal.	.24	.29
C-42	gal.	.23	.28
Union Solvent 4060-O	gal.	—	.147
X-1 Resinous Oil	lb.	.0190	.0285
X-60 Solvent	gal.	.24	.32

REINFORCING AGENTS—CARBON BLACK

Channel, Hard Processing (HPC) (bags)

Atlantic HPC-98	lb.	.0690	.1175
Continental F	lb.	.0690	.1125
Croflex	lb.	.0690	.1125
Crow	lb.	.0690	.1125
Dixiedensed (and S)	lb.	.0690	.1125
Kosmobile (and S)	lb.	.0690	.1125
Kosmos T	lb.	.0690	.1175
Micronex HPC	lb.	.0690	.1125
Spheron 4	lb.	.0690	.1170
Witco Disperso No. 6	lb.	.0690	.1125

Channel, Medium Processing (MPC) (bags)

Atlantic MPC-95	lb.	.0690	.1175
Continental A	lb.	.0690	.1125
Croflex TH	lb.	.0690	.1125
Dixie R-1	lb.	.0690	.1125
Dixiedensed HM (and S-66)	lb.	.0690	.1125
Huber Arrow TX	lb.	.0690	.1150
Kosmobile HM (and S-66)	lb.	.0690	.1125
Kosmos M	lb.	.0690	.1125
Micronex Standard	lb.	.0690	.1175
Spheron 6	lb.	.0690	.1170
Texas M	lb.	.0690	.1125
Witco Disperso No. 1	lb.	.0690	.1125

Channel, Easy Processing (EPC) (bags)

Atlantic EPC E-42	lb.	.0690	.1175
Continental AA	lb.	.0690	.1125
Croflex 77	lb.	.0690	.1125
Dixiedensed 77	lb.	.0690	.1125
Kosmobile 77	lb.	.0690	.1125
Micronex W-6	lb.	.0690	.1175
Spheron 9	lb.	.0690	.1170
Texas E	lb.	.0690	.1125
Witco Disperso No. 12	lb.	.0690	.1125
Wyex	lb.	.0690	.1150

Channel, Conductive (CC) (bags)

Dixie 5 Dustless	lb.	.0868	.1425
Kosmink dustless	lb.	.0868	.1425
Spheron C	lb.	.1200	.1600
Spheron N	lb.	.2300	.2800
Voltex	lb.	.1800	.2150

Furnace, Fast Extruding (FEF) (bags)

Dixie 50	lb.	.0600	.1000
Kosmos 50	lb.	.0600	.1000
Statex M	lb.	.0600	.1000

Furnace, High Modulus (HMF) (bags)

Continex HMF	lb.	.0500	.0900
Dixie 40	lb.	.0500	.0900
Kosmos 40	lb.	.0500	.0900
Modulex	lb.	.0500	.0900
Statex 93	lb.	.0500	.0900
Sterling L	lb.	.0500	.0900
Sterling SO	lb.	.0600	.1000

Furnace, Medium Abrasion (MAF) (bags)

Phillblack A	lb.	.0600	.1000

Furnace, Reinforcing (RF) (bags)

Dixie 60	lb.	.0790	.1175
Kosmos 60	lb.	.0790	.1175

Furnace, Semi-Reinforcing (SRF) (bags)

Continex SRF	lb.	.0350	.0775
Dixie 20	lb.	.0350	.0750
Essex	lb.	.0350	.0775
Furnex	lb.	.0350	.0750
Gastex	lb.	.0350	.0750
Kosmos 20	lb.	.0350	.0750
Pelletex	lb.	.0350	.0750
Seminex	lb.	.0350	.0775
Sterling NS	lb.	.0350	.0750
Sterling R	lb.	.0350	.0750
Sterling S	lb.	.0350	.0750

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REINFORCING AGENTS—CARBON BLACK (Cont'd)

Furnace, Fine (FF) (bags)

Statex B	lb.	.0600 -	.1000
Sterling 99	lb.	.0600 -	.1050

Furnace, High Abrasion (HAF) (bags)

Aromex	lb.	.0790 -	.1250
Philblack O	lb.	.0790 -	.1190
Statex R	lb.	.0790 -	.1250
Vulcan 3	lb.	.0790 -	.1220

Furnace, Very Fine (VFF) (bags)

Statex K	lb.	.0740 -	.1200

Thermal, Fine (FT) bags)

P-33 (c.l.)	lb.	— -	.0500

Thermal, Medium (MT) (bags)

Thermax (c.l.)	lb.	— -	.0325
Thermax, Stainless (c.l.)	lb.	— -	.0400

REINFORCING AGENTS—SILICA

Hi-Sil	ton	220.00 -	240.00

REINFORCING AGENTS—MISCELLANEOUS

Darex Copolymer No. 3	lb.	.42 -	.44
X34	lb.	.37 -	.39
X43 (and 43E)	lb.	.38 -	.40
Darex Copolymer Latex No. 3 (and X34)	**lb.**	**.36½ -**	**.50**
Durez 12687 (and 12707)	**lb.**	— -	**.32**
Durez 13355	**lb.**	— -	**.26**
Good-Rite Resin 50	lb.	.36 -	.38
Marbon S and S-1	**lb.**	**.36 -**	**.43**
8000	lb.	.36 -	.43
Marmix	**lb.**	**.36 -**	**.43**
Phlolite Latex 190	lb.	.30 -	.34
Phlolite NR	lb.	.74 -	.76
Phlolite S6 (and S6B) Resin	lb.	.36 -	.37
C-3 Masterbatch	lb.	.47 -	.48
C-4 Masterbatch	lb.	.45 -	.46
G Masterbatch	lb.	.35 -	.36
G50 Masterbatch	lb.	.35 -	.36
N Masterbatch	lb.	.40 -	.41
R Masterbatch	lb.	.43 -	.44
Polyco 220	**lb.**	**.13 -**	**.15**

RETARDERS

Dutch Boy Normasal	lb.	— -	.41¾
ESEN	lb.	— -	.36
Retarder ASA	**lb.**	— -	**.45**
Retarder PD	lb.	.34 -	.36
Retarder W	**lb.**	— -	**.43**
Retardex	lb.	.47 -	.50

RUBBER SUBSTITUTES

Mineral Rubber

38	ton	38.00 -	40.00
Black Diamond	ton	38.00 -	40.00
Byerlyte	ton	47.00 -	54.00
Gilsonite, Selects (c.l.)	ton	33.50 -	36.00
Hard Hydrocarbon (dms.)	ton	42.50 -	44.50
Herron Flake	**ton**	**48.50 -**	**49.50**
Mineral Rubber, solid	ton	42.50 -	44.50
Pioneer	ton	35.00 -	46.00

Vulcanized Vegetable Oils (Factice)

Amberex	lb.	.28 -	.32
Brown	lb.	.1310 -	.1955
Dispersed	lb.	.22 -	.42
Neophax	lb.	.16 -	.24
White	lb.	.13 -	.24

Miscellaneous Rubber Substitutes

G.B. Asphaltenes	lb.	**.06 -**	**.06½**
Gilsowax B	lb.	.09 -	.11
Resin No. 1098 (drums)	lb.	— -	.62
No. 1198	lb.	.46¾ -	.49¾

SOLVENTS

Acetone (dlvd.)	lb.	.07½ -	.10
American Dipentine	gal.	.20 -	.36
American Pine Oil	gal.	.64 -	.65
Amsco Lactol Spirits (t.c.)	gal.	— -	.17
Rubber Solvent (t.c.)	gal.	— -	.16
Solv A (t.c.)	gal.	— -	.21½
Solv A-80 (t.c.)	gal.	— -	.26
Solv B (t.c.)	gal.	— -	.25
Solv B-90 (t.c.)	gal.	— -	.28½
Solv D (t.c.)	gal.	— -	.25¾
Special Naphthalite (t.c.)	gal.	— -	.16
Textile Spirits (t.c.)	gal.	— -	.17
Amyl Chlorides, Mixed (l.c.l.) (drums)	**lb.**	— -	**.08**
Aromatic Solvent 40	gal.	— -	.219
Benzol 90%	**gal.**	**.17 -**	**.24**
Butyl Acetate (t.c.)	lb.	.13 -	.175
Butyl Alcohol (t.c.)	lb.	.13 -	.175
Secondary (dlvd.)	lb.	.09 -	.11
Tertiary (dlvd.)	**lb.**	**.12 -**	**.14**
Carbon Bisulfide, Tech.	lb.	.0440 -	.0800
Carbon Tetrachloride	lb.	.08 -	.08½
Cosol 1	**gal.**	**.30 -**	**.38**
Cosol 2	**gal.**	**.30 -**	**.38**
Cyclohexane	lb.	.09¼ -	.11¾
Cyclohexanone	**lb.**	**.25 -**	**.27** *
Diacetone, Pure (dlvd.)	lb.	.12 -	.14½

SOLVENTS (Cont'd)

Dichlorethyl Ether (dms.)	**lb.**	**.165 -**	**.17**
Formal (dms.)	**lb.**	**.265 -**	**.27**
Dichloropentane (t.c.l.)	lb.	.04 -	.05½
Dicom	gal.	.30 -	.42
Dipentene 122 (dms.)	**gal.**	**.35 -**	**.36**
Halowax Oil	**lb.**	**.25 -**	**.37**
Heptanes (t.c.)	gal.	.17 -	.22
Hexalin Cyclohexanol	**lb.**	**.20 -**	**.22** *
Hexanes (t.c.)	gal.	.17 -	.22
Isopropyl Alcohol, Ref. 99% (dlvd.)	gal.	.35 -	.52
Ether, Ref. (dlvd.)	gal.	.04½ -	.06½
Mesityl Oxide (dlvd.)	lb.	.11½ -	.14
Methyl Acetone, Syn. (drums, dlvd.)	gal.	.615 -	.65
Methyl n-Amyl Ketone (drums)	**lb.**	**.37 -**	**.39**
Methyl Ethyl Ketone	lb.	.10 -	.12½
Methyl Isobutyl Ketone (dlvd.)	**lb.**	.12 -	.14½
N-5 Pentane Mix. (t.c.)	gal.	— -	.13½
N-6 Hexanes (t.c.)	**gal.**	— -	**.14**
N-7 Hexanes (t.c.)	**gal.**	— -	**.13**
Petrolene (t.c.)	**gal.**	— -	**.10½**
Picolines, Aplha, Refined	lb.	**.75 -**	1.00
Mixed	lb.	— -	.45
Proprietary Alcohol (t.c.)	**gal.**	— -	**.43½**
Pyridine, Refined	lb.	**.80 -**	**.89**
Quinoline	lb.	**.50 -**	**.60**
Rubber Solvent (t.c.)	gal.	— -	.16
Rubsol (t.c.)	gal.	— -	.08625
Skellysolve B (Hexanes) (t.c.)	gal.	— -	.148
C (Heptanes) (t.c.)	gal.	— -	.141
E (Octanes) (t.c.)	gal.	— -	.155
R (Solvent Naphtha)	gal.	— -	.114
Solvenol (dms.)	**gal.**	— -	**.36**
Solvent, Crude, Light	gal.	**.19 -**	**.28**
Solvesso 100 (t.c.)	gal.	— -	.28
150 (t.c.)	gal.	— -	.28
Sunny South Dipentene	gal.	.20 -	.36
Sunny South Pine Oil	gal.	.64 -	.65
Toluene (drums)	gal.	— -	.28
Toluol (t.c.)	**gal.**	— -	**.30**
Trichlorethane	**lb.**	**.11 -**	**.12**
Triglycol Dichloride (dms)	lb.	.53 -	.54
Tromex	**lb.**	**.078 -**	**.083**
Union Thinner 1	gal.	— -	.161
3	gal.	— -	.161
7	gal.	— -	.151
2-50-W Hi-Flash	gal.	— -	.38
X-7 Sp. Heptanes (t.c.)	gal.	— -	.11

STABILIZING AGENTS (for Vinyl Resins)

Basic Silicate White Lead	lb.	.13¾ -	.14¾
No. 201	lb.	.16¼ -	.17¼
BVS	lb.	— -	.60
Cadmium Stearate	lb.	— -	1.25
Dutch Boy DS-207	lb.	— -	.50¾
Plumb-O-Sil A	lb.	— -	.28
B	lb.	— -	.29½
Tribase	lb.	— -	.24¼
Dythal	lb.	— -	.37½
Lead Stearate, Precip.	lb.	.36 -	.38
Fused	lb.	— -	.35½
Lithium Stearate	lb.	.63 -	.65
Stabelan E	lb.	1.25 -	1.40
XL	**lb.**	**.55 -**	**.65**
Stabilizer No. 3	lb.	— -	2.00
Stabilizer No. 21	lb.	— -	.90
Stabilizer No. 52	lb.	— -	2.00
Stabilizer E6B	lb.	— -	.85
Stabilizer JCX	lb.	— -	.49
Stabilizer L	lb.	— -	.60
Stabilizer SN	lb.	— -	.42
Stabilizer V-1-N	lb.	— -	.50
Stabilizer V-9	lb.	— -	.85
Stabilizer V-7939	**lb.**	— -	**.60**
Vanstay	**lb.**	**.33 -**	**.35**

SUN CHECKING AGENTS

Antisol	lb.	.25 -	.26
Antisun	lb.	— -	.21
Heliozone	**lb.**	**.25 -**	**.26**
Sharples Wax	lb.	.23 -	.28
Sunolite	lb.	.20 -	.23
Sunproof	lb.	.25 -	.26
Imp.	lb.	.23 -	.24
Jr.	lb.	.18 -	.19
Tonox	lb.	.50 -	.52

TACKIFIERS

Advaresin 100	**lb.**	**.13½ -**	**.14**
Agchem RC 30	**gal.**	**.65 -**	**1.34**
Arcco 493-49B	**lb.**	**.15 -**	**.17**
700-25A	lb.	.14 -	.16
U2-24	lb.	.11 -	**.13**
Beckopol 1400 (dlvd.)	**lb.**	**.25½ -**	**.26**
Dutrex 44	**gal.**	— -	**.919**
Galex (drums)	**lb.**	— -	**.15**
Indopol H-300 (bbls.)	gal.	1.12 -	1.16
Koresin	lb.	.73 -	.75
Nilox	cwt.	12.50 -	13.50
Pentalyn A (dlvd.)	lb.	.12½ -	.13
Resin V	**lb.**	— -	**.23¼**
Rubtack	**lb.**	— -	**.12**
Staybelite Ester No. 10 (dlvd.)	lb.	.19¾ -	.20¼
Super-Beckacite No. 1001 (dlvd.)	**lb.**	**.34 -**	**.34½**
Synthol	lb.	— -	**.20½**
Vistac No. 1	gal.	1.00 -	1.16
No. 2 (c.l.)	gal.	1.22 -	1.26
No. 4 (c.l.)	gal.	1.32 -	1.36
A	lb.	— -	.20¼
Zirex	cwt.	12.00 -	12.80

THICKENERS (FOR LATEX)

Alcogum AN-6	lb.	— -	.05
AN-10	lb.	— -	.08½
Betanol (drums)	**lb.**	— -	**.70**
Emulsorex No. 5	**lb.**	— -	**.35**
Lecithin	**lb.**	**.12 -**	**.17**
Modicol VD	lb.	— -	.12½
VE	lb.	— -	.10⅞
VF	lb.	— -	.10⅞
VK	lb.	— -	.07
Polyco 296	lb.	.13 -	.13½
Propylene Laurate (dms.)	**lb.**	— -	**.36**
Sodium Silicate	cwt.	1.50 -	2.65

VULCANIZING AGENTS

Selenium

Ancasal*	lb.	— -	2.00
Vandex	lb.	— -	2.25

Sulfur

Blackbird	**cwt.**	— -	**2.30**
Crystex	lb.	.19½ -	.23
Darex Dispersed Sulphur	lb.	.12 -	.17
Dispersed Sulfur	lb.	.12 -	.17
Devil (c.l.)	**cwt.**	— -	**1.75**
Insoluble Sulfur 60	**lb.**	**.13 -**	**.13½**
Spider	**cwt.**	— -	**2.30**
Star (c.l.)	**cwt.**	— -	**2.25**
Tire (c.l.)	cwt.	— -	1.75
Tube	cwt.	— -	2.25

Tellurium

Ancatel*	lb.	— -	2.00
Latex Telloy	lb.	— -	2.00
Telloy	lb	— -	2.00

WASHING & FINISHING AGENTS

Apcolene (t.c.)	gal.	— -	.09½

WETTING AGENTS

Advawet No. 10	lb.	— -	.35
No. 15	lb.	— -	.20½
No. 33	lb.	— -	.39
Aerosol OT 70% Clear	**lb.**	**.80 -**	**1.00**
Agchem SA-15 (16, 18)	**lb.**	**.17 -**	**.29**
Alrosol (dms.)	**gal.**	— -	**.48**
Aquarex D	**lb.**	— -	**.76**
MIDL Paste	lb.	— -	.30
ME	lb.	— -	**.92**
NS	lb.	— -	.60
WA Paste	lb.	— -	.25
Areakap 50	**lb.**	**.30 -**	**.38**
Dry 100	lb.	.60 -	**.72**
Aresket 240	**lb.**	**.30 -**	**.38**
Dry 300	lb.	.60 -	**.72**
Areklene 375	**lb.**	**.42 -**	**.57**
Dry 400	lb.	.70 -	**.84**
Armacs	**lb.**	**.29 -**	**.76**
Arquads	lb.	.21 -	.61
Etho-chemicals	**lb.**	**.34 -**	**.80**
Lecithin	lb.	.18 -	.26
Modicol L	lb.	— -	.58
N	lb.	— -	.40
S	lb.	— -	.22
Nopco 1086-A	lb.	.42 -	.50
7187-X	lb.	— -	.14½
Parnol	lb.	.13 -	.18
Santomerse D	**lb.**	**.43 -**	**.65**
S	**lb.**	**.12 -**	**.25**
Sorbit P	lb.	— -	**.28**
Stablex G	lb.	.50 -	.70
Trenamine W-30	lb.	— -	.15
Vultamol	**lb.**	— -	**.17½**
Wetsit Conc.	lb.	.25 -	.32

MISCELLANEOUS CHEMICALS

Acto 450 (550-W, 600, 630)	lb.	.109 -	.145
Agchem SA-17	**lb.**	— -	**.29**
Aquarex SMO	**lb.**	— -	**.50**
A.S.T.M. Oil No. 1 (and No. 3)	**gal.**	**1.00 -**	**1.15**
Copper Inhibitor X-872-L	lb.	— -	1.95
D-Tac	lb.	.21 -	.23
2-Ethylhexanol (dms.)	**lb.**	**.25 -**	**.26**
Glycerine, 88% Sap., Crude (dlvd.)	lb.	.25 -	.25½
MODX	lb.	.295 -	.345
NBC	lb.	— -	1.50
Para Resin No. 2457 (c.l.)	lb.	— -	.04
No. 2718 (c.l.)	**lb.**	— -	**.04**
Pigmented Filmite	lb.	— -	.16½
Polyvinyl Methyl Ether	**lb.**	— -	**1.00**
Reference Fluid SR-6	gal.	**.85 -**	**1.00**
SR-10	gal.	.60 -	.75
Resin No. 1226	**lb.**	**.31½ -**	**.36½**
Rio Resin	lb.	.52 -	.54
RR-10	lb.	— -	.55
Santocel	**lb.**	— -	**.50**
Sherosope L, N, F-445 and P	lb.	.12½ -	.15
Sublac B2	lb.	.26 -	.28
PX-5	lb.	.26 -	.28
Synpep N (drums)	**lb.**	— -	**.54**
Thiokol LP-2	**lb.**	— -	**.90**
LP-3	lb.	— -	.90
Tysonite	**lb.**	**.21½ -**	**.22¾**
Vanfre	**gal.**	**2.00 -**	**2.50**
Vinsol Resin—Lumps	cwt.	— -	3.25

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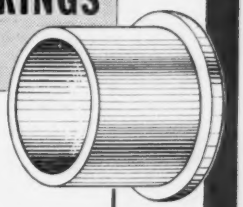

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Copy for September, 1950, issue, must be received by Friday, September 1st.

POSITIONS WANTED

CHEMIST, wishes to enter sales work as a novice. Many years of sound laboratory and factory training in coatings on all types of sheet materials, adhesives, rubber, plastics, resins, plasticizers. Wish to do sales work for large manufacturer. Address Box 756-P, RUBBER AGE.

DESIGNER: B. S. M. E., M. A. E. Six years experience with major rubber company, two years with major auto company. Interested in product design, also know mold design and rubber machinery. Address Box 760-P, RUBBER AGE.

RUBBER COMPOUNDER or TECHNICAL SERVICE REPRESENTATIVE: Over ten years experience with tires, tubes, air bags from laboratory testing to factory processing. Some acquaintance in Ohio and Michigan area. Address Box 762-P, RUBBER AGE.

TECHNICAL DEVELOPMENT MANAGER: Ten years proofing experience, nine years adhesives. Rubber, synthetic rubbers, resins. Compounding, development, factory control, sales-service. Interested in becoming assistant to principals in product development and customer contact. Chemical Engineer. Address Box 763-P, RUBBER AGE.

RELIABLE ASSISTANT to chief chemist in adhesives, pressure- tapes, laminants, coatings of rubber, lacquers, plastics. Extensive and good practical experience. Address Box 757-P, RUBBER AGE.

TECHNICAL REPRESENTATIVE: Chemical Engineer, nineteen years experience in rubber and synthetics, formulation, development, production, technical service and sales of coated fabrics and adhesives. Operated technical consultant service. Interested in becoming Boston technical representative. Address Box 764-P, RUBBER AGE.

CHEMIST-SUPERINTENDENT: Over twenty years experience production., management, testing, and compounding natural and synthetic rubber for molded goods and mechanicals—experienced high temperature high speed curing. Can cut your material and manufacturing costs. Available in consulting capacity. Address Box 767-P, RUBBER AGE.

RESEARCH CHEMIST or TECHNICAL SUPERINTENDENT: Twenty years experience in compounding and manufacturing of natural and synthetic rubber products, plastic and synthetic resins, reclaimed rubber and diversified chemicals. Excellent chemical background. Address Box 768-P, RUBBER AGE.

Aggressive Graduate CHEMICAL ENGINEER: Ten years diversified industrial experience: rubber, synthetics, plastics, and colloidal fillers. Research, development, application-engineering, plant supervision, trouble-shooting. Banbury mixing, milling, calendering, extruding. Positive record of achievement. Technical Service, Production, Research. Address Box 769-P, RUBBER AGE.

ELEVEN YEARS rubber experience, including compounding, production supervision and equipment design and development. Knowledge natural and synthetic rubbers and resins. Developed hard rubber products and abrasives. Desire technical, supervisory, engineering or design position. Address Box 770-P, RUBBER AGE.

POSITIONS WANTED (Continued)

CHEMIST-SUPERINTENDENT: With over twenty years experience in the laboratories on compound, process, and product development, along with general factory engineering and management. Products: tires, tubes, sole slabs, printers' rolls and various other mechanicals of synthetic and natural rubbers. Address Box 771-P, RUBBER AGE.

PRODUCTION SUPERINTENDENT and CHIEF ENGINEER: Twenty years experience in the molded and foam rubber business. Address Box 773-P, RUBBER AGE.

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TECHNICAL SERVICE: Graduate chemist or chemical engineer with five years or more experience in rubber compounding, plastics, adhesives or resins to head a newly organized technical service group in the research laboratories of a major manufacturer. Salary and responsibility to be commensurate with ability. A major opportunity for the right man. Location—Chicago. Address Box 765-W, RUBBER AGE.

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HELP WANTED (Continued)

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WANTED: 40" to 60" mill, with drive. Address Box 774-E, RUBBER AGE.

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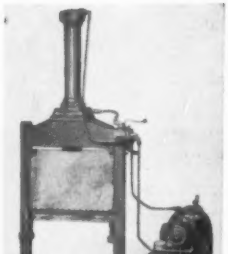

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